July 1961

The Airpower HISTORIAN

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The Retiring Chief of Staff of the United States Air Force.

THE AIR FORCE HISTORICAL FOUNDATION

GENERAL THOMAS D. WHITE
The Retiring Chief

The Airpower Historian takes this opportunity to pay a singular honor to the retiring Chief, General Thomas D. White. Burdened with the responsibilities and the successive challenges of that high office, this distinguished officer-statesman has served his country well. Though he now retires from active duty, his contributions to the security and welfare of this nation will be enduring. Because of his extensive knowledge of air power and his understanding of the communist challenge, future strategic planners will surely profit from his counsel and advice.

We salute the departing Chief!

It is the Nation's good fortune that his successor, General Curtis E. LeMay, convincingly displays the competence and courage to carry on in the tasks that high office imposes.

The Airpower HISTORIAN

THE AIR FORCE HISTORICAL FOUNDATION

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THE AIR FORCE HISTORICAL FOUNDATION

THE ZEPPELIN BOMBER

High Policy Guided by Wishful Thinking

By DR. DOUGLAS H. ROBINSON, M.D.
Pennington, New Jersey

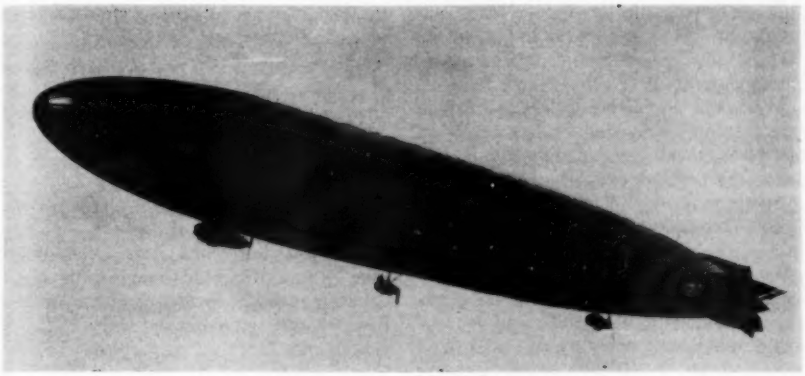
YEARS BEFORE General Giulio Douhet published his theories of strategic bombing, and even before the rise of Billy Mitchell, the belligerents in World War I were testing the theory that strategic bombing directed against the enemy's cities could not only cripple his war effort by destroying its industrial base, but could also demoralize his civilian population and force it to sue for peace. The heaviest and most persistent effort was made by Imperial Germany. Not only was she first in the race to develop a strategic bomber; her population, and more remarkably, many of her military and naval leaders, were motivated by a profound psychological need to strike back at her chief enemy, England, which was otherwise seen as inaccessible, invulnerable, and overpowering in her superiority to the Kaiser's *Reich* in wealth and resources. In an effort to stab the enemy to the heart, the German armed forces poured out blood and treasure, refusing to accept the negative verdict of trial by battle.

The weapon, the hydrogen-inflated Zeppelin airship, was in retrospect so grotesquely unsuited to its mission that one can only wonder at the courage of the flight crews to whom it brought so often a horrible death. Yet, for Germany, the Zeppelin in the summer of 1914 seemed a unique weapon of aerial superiority. Where the average military airplane of the day was an underpowered two-seater observation type with a useful load of not more than 500 pounds (the 4-engined Russian Sikorsky was the only exception worth mentioning), the Zeppelin at that time could carry a useful load of 20,000 pounds, including fuel for 30 hours, a crew of 16, and 1100 pounds of bombs.

Count Ferdinand von Zeppelin, whose name will always be associated with the large rigid airship, had conceived it originally as a military weapon, and as early as 1874 had forseen it, not only in the role of long-range reconnaissance, but also as a carrier of "explosive shells." His unrealistic hopes for his first design reflected his lack of engineering training: his "Deutschland" proposal, 384 feet long, 36 feet in diameter, and to be powered by two 11 h.p. motors each weighing 1100 pounds, was a flat-ended monstrosity designed to tow personnel and military loads in a series of coupled rigid-framework balloons! This "aerial express train" was quite rightly rejected by a commission appointed by the Kaiser in 1894, and the Count's first airship, built in 1900 without government support, was more conventional in design. Yet this LZ 1, and its 1905 successor, were failures despite their great size—not only were they underpowered, but the inventor was incapable of making realistic speed and drag calculations.

It was another failure—in 1908—that made the Count a national hero. During an attempt to fulfill a War Ministry requirement for a 24-hour flight, the fourth Zeppelin made a forced landing at Echterdingen and burned. But the giant airship—despite its frailties—had profoundly moved the people as a *Kolossal* symbol of Teutonic superiority; and the old aristocrat, with his patriotic determination to develop this weapon for the defence of the Fatherland, was the darling of the country from that time forth.

German public opinion was a large



A HIGH ALTITUDE BOMBER OF 1917: L 49, commissioned on June 15, 1917, was capable of reaching 20,000 feet with three tons of bombs. 644 feet long and 78 feet in diameter, she had a gas volume of nearly 2,000,000 cubic feet and a useful lift of 87,200 lbs. Her five Maybach 240 h.p. engines gave her a trial speed of 65.8 m.p.h. On her only raid on England, Oct. 19, 1917, she was blown over France, captured intact, and served as the prototype for the U.S.S. "Shenandoah."

factor in forcing the Zeppelin airship on the Army, which, between 1909 and August 1914, purchased twelve of the gas-filled monsters, but never evolved any doctrine for their employment. The six remaining at the outbreak of war were at first held back, then sent out in daylight reconnaissances at low altitude, and within a month four of them had been lost.

The German Navy, paradoxically, had early seen the Zeppelin as ideally suited for reconnaissance at sea on behalf of an inferior fleet, but for a variety of reasons it purchased none before 1912. Grand Admiral Alfred von Tirpitz, the all-powerful creator of the High Seas Fleet, had shown an interest in Zeppelins for scouting as early as 1906, but his chief concern was the building of a "risk Navy" of dreadnoughts and torpedo boat destroyers as a deterrent to British maritime supremacy, and he would not divert funds from this goal. Furthermore, Count Zeppelin stubbornly refused to build craft large enough to meet the Navy's requirements, which could not be satisfied with a displacement of less than 1,000,000 cubic feet. Nevertheless, Tirpitz was bombarded by his subordinates with papers recommending the procurement of Zeppelins, which (in 1908) not only might be towed to sea by cruisers, thus conserving their fuel for the moment of action, but also would "eventually be able to be used with great success for independent operations against the enemy coast (attack on vital objectives thereon by dropping shells, etc.)."

Tirpitz preferred to observe the Army's Zeppelin experiments while spending his money on surface ships. Pressure of public opinion, and the intervention of the Kaiser, persuaded him early in 1912 to order a Zeppelin, to assign personnel for training, and to commence construction of an "airship harbor" on the North Sea coast near Cuxhaven with a double revolving hangar 590 feet long that could be rotated through 360 degrees in one hour. L 1's 31-hour acceptance flight on October 13-14, 1912, led to a rash of false alarms in England, where phantom airships were reported nightly in the same manner as "flying saucers" in our day. But within a year L 1 went down at sea in a storm, and shortly thereafter L 2, built to Navy specifications, burned in the air on a trial flight with all 28 men aboard. A third ship was ordered

and delivered shortly before the outbreak of war, and was the German Navy's only lighter-than-air craft in service in August 1914.

War, and a defensive strategy, forced an overnight expansion of the neglected German Naval Airship Division. For years, the German Navy had taken it for granted that the British Fleet would closely blockade the North Sea coast, and could not believe that their adversaries instead had chosen to establish the blockade line between the remote Orkneys and distant Norway. The Kaiser, furthermore, who often treated his prized dreadnoughts as if they were personal possessions, refused to allow the battle fleet to be risked in offensive operations. Surely the English would come. A watch must be kept on the North Sea. Yet the small craft of the High Seas Fleet would be rapidly worn out by constant patrolling. A Zeppelin could be built in six weeks, and daily Zeppelin patrols over the so-called German Bight seemed to be the answer. Overnight the German Admiralty poured out orders for Zeppelins and contracted for airship sheds. In the face of the national emergency, Count Zeppelin had to give way. The Navy moved into Friedrichshafen, and not only insisted on the development of a new airship of 1,126,000 cubic foot capacity, but promoted many improvements in design.

The Kaiser and his Chief of the Naval Staff conceived of the Zeppelin as a defensive reconnaissance craft, but there were other officers who saw it as a strategic bomber which could directly influence the outcome of the war. In this, they were only reflecting the hysterical demands of the populace, which, unprepared for the entry into the lists against them of the world's greatest Empire, was screaming for revenge against "perfidious Albion." In their frustration, and remembering the impressive spectacle of the giant airships soaring overhead, the German people turned to old Count Zeppelin, the miracle-worker of the days of peace. In the fall of 1914 even the children were singing:

Zeppelin, fly,
Help us in war,
Fly to England,
England shall be consumed with fire,
Zeppelin, fly!

The naval officers who looked to the Zeppelin to win the war had compelling reasons of their own. At this length of time, it is difficult to imagine the overwhelming moral preponderance of the Royal Navy, unchallenged since Nelson's victory at Trafalgar a century before. Furthermore, the Mistress of the Seas was jealous to maintain her dominance, and in an age in which the battleship was the yardstick of sea power, her slogan of "two keels for one" had created an unequalled force of dreadnoughts and battle cruisers. German dreams of naval rivalry—embodied in the concept of the "risk Navy" which England could not afford to disregard—proved empty in the face of simple arithmetic—twenty-four British dreadnoughts and battle cruisers to 16 Germans. The German Navy was back where it had started fifty years before under Admiral Prince Adalbert—"too small for living and too big for dying." Remorselessly, as she had done in so many earlier wars, England, shielded by her Fleet, could raise a host of allies against the continental enemy and strangle him by blockade.

Many of the younger German officers felt acutely the need for a weapon with which they could strike at the enemy despite British predominance at sea. A few, perceiving that the battleship was not the ultimate weapon, turned to the submarine, of which the *Reich* possessed twenty at the outbreak of war. Others saw the Zeppelin as a means of leaping over the wall of ships to strike directly at the enemy's heart. The wish that England, particularly London, should be destroyed from the air, led to the conviction that this was possible.

In the forefront of this emotionally-inspired campaign stood Rear Admiral Paul Behncke, the Deputy Chief of the

Naval Staff. Left behind in Berlin to "mind the office" after his superior, Admiral Hugo von Pohl, went off with the Kaiser to Imperial Headquarters in France, Behncke certainly displayed more energy and insight than his chief. Admiral Philipp, appointed on August 29, 1914, to be "Chief of the Naval Air Forces," had had no personal aviation experience, but naturally favored an offensive mission for his own arm. Last, but not least, came the Commander of the Naval Airship Division, *Korvettenkapitän* Peter Strasser, a man of remarkable organizing ability, indomitable energy, and great personal charm, who during the succeeding years made his mark as one of the outstanding type commanders on either side in World War I. A fanatical believer in his Zeppelins, Strasser was fated to die leading them in a final assault on England after the war had already been lost. The record supports the conclusion that he allowed the strategic bombing campaign to take precedence over the airship's true role in naval warfare—long-distance scouting at sea. In the higher councils of the German Navy, Strasser came to wield an influence out of all proportion to his rank, particularly after Admiral Reinhard Scheer succeeded to the Fleet command in January 1916.

Months passed, however, before the strategic bombing advocates had their way. Against them were arrayed, not merely the Chief of the Naval Staff, the deferential courtier Admiral von Pohl, and the irresolute Chancellor, Theobald von Bethmann-Hollweg, but the Kaiser himself. Often represented as the bloodthirsty advocate of *Schrecklichkeit*, Wilhelm II was in fact the chief obstacle to both the air war on England and the unrestricted U-boat campaign. The records show that in the fall of 1914 the generals and admirals, forced to bend to the vacillating will of the All Highest, lived in an agony of apprehension and uncertainty concerning the day-to-day future of their plans. In particular, the Kaiser, with his love-hate complex toward England, felt a constant solicitude for historical monuments in London and for the personal safety of his royal cousins, the King and Queen of England.

The earliest letter to be found in the German Navy file on the initiation of the strategic bombing campaign is dated August 20, 1914. Excited by the news of the German Army's capture of Liege and Brussels in Belgium, Admiral Behncke wrote to his superior, Admiral von Pohl, on the possibilities opening up for aerial attack on England. The Army might be expected, he wrote, to seize the Belgian and French coasts as far west as Cape Gris Nez (his prophecies nearly came true, the trenches eventually reaching the sea west of Nieuport in Belgium), in which case airship bases could be set up at Nieuport, Ostend and Zeebrügge in Belgium, or Dunkirk and Calais in France. From these, he predicted that Navy Zeppelins, carrying twenty 110-pound bombs, could travel 460 miles—as far north as a line drawn from Glasgow to Dundee in Scotland. (Later experience would show that the L 3 type of Zeppelin, under favorable cold-weather conditions, could lift enough fuel to fly barely 400 miles and back, together with not more than 1000 pounds of bombs). Behncke pointed out the importance of bombing London, its docks, and the nerve-center of the enemy's Navy, the Admiralty building in Whitehall. Such attacks "may be expected, whether they involve London or the neighborhood of London, to cause panic in the population which may possibly render it doubtful that the war can be continued." Next to London, the naval bases at Dover and Portsmouth would be the most important targets, while the Rivers Humber and Tyne, the Firth of Forth, Plymouth and Glasgow were also mentioned. "In general," concluded Behncke, "air attacks with airplanes and airships from the Belgian and French coasts, particularly with airships, promise considerable material and moral results. They must, therefore, be considered an effective means of damaging England."

Only two Zeppelins, L 3 and the new

L 4, were on hand when von Pohl replied on September 4 to Behncke's letter. The High Seas Fleet was short of cruisers, and von Pohl's insistence that the small number of airships on hand should be reserved for scouting and not risked on raids, was entirely realistic. Yet this consideration was never allowed to stand in the way of raids, and there were later occasions when the Commander-in-Chief of the Fleet was ordered to hold back a bare minimum of airships for scouting, and to send the rest out against England.

New Zeppelins—duplicates of L 3, with short range, low lift, and open gondolas—were coming forward, though not without opposition from the Army. There was an uneasy agreement that the services would divide equally the products of the airship industry, but the Army could not resist demanding the Navy's Zeppelins also when their need was desperate. Thus, as the Navy's L 5, L 6 and L 7 approached completion, the General Staff demanded each in turn, repeating its demand for L 5 a week after she had been commissioned as a naval vessel! As for the new Navy airship bases, not only were they arranged to facilitate defensive scouting of the German Bight, but three hangars were to be located at Namur, far forward in Belgium. Thus was revealed the Navy's passionate determination to win the glittering triumph of making the first air raid on England.

Admiral Philipp, writing to von Pohl on October 2, agreed that the primary mission of the Naval Airship Division must be scouting for the Fleet, but if enough airships were on hand, an "expedition" to England could be considered. One could leave Hamburg-Fuhlsbüttel at 7 A.M., reach the English coast at 7 P.M., operate with the onset of darkness over London or Chatham, and next morning could be back over the Elbe. October would be a month of suitably calm and cool weather, while November could be expected to be stormy. Philipp was opposed to using Namur—there was still considerable civil disturbance in Belgium, and he feared that as the Zeppelins hovered low on take-off or landing, an incendiary bullet from a house or bush could destroy them. Also, "if a ship is sent to Belgium, the Army High Command will try to commandeer it for their own purposes."

A few days later, Behncke wrote to von Pohl supporting Philipp's request. The Zeppelins of the L 3 class, he submitted, could reach the Thames from Nordholz, and possibly even the west coast of England if lightened of equipment and personnel. The first raid should be on London and the banks of the Thames down to Woolwich. Damage in the center of the capital would have the greatest moral effect. Behncke further indicated his ideas by a draft of a proposed order (which was never issued) to the Commander-in-Chief of the High Seas Fleet:

> (1) As soon as possible, an airship is to carry out an attack on England. The time of the attack and choice of airship will be decided by the Commander-in-Chief of the High Seas Fleet.
>
> (2) Target area will be London and the Thames region from London to Woolwich-Becton (sic.) inclusive. Chief target within this area is the Admiralty with its radio station. Further targets are: main telegraph office, gas works in London-Becton harbor works west and south of Woolwich, oil tanks at Greenwich and Woolwich, and the Woolwich Arsenal.
>
> Buildings of historic value, monuments, etc., are to be spared as far as possible.
>
> (3) After completing the operation against London, or if the operation against London cannot be carried out, other places in England may be attacked. These primarily include: Immingham, Dover, Portsmouth, Southampton, Liverpool, and Manchester.

Behncke added that a particular moral effect would result from bombing Liverpool and Manchester because of the great distance from the German bases. His letter is given in some detail because,

for what it was worth, this "master bombing plan" was what guided the naval airships through four years of war. He concluded, "we dare not leave untried any means of forcing England to her knees, and successful air attacks on London, considering the well-known nervousness of the public, will be a valuable measure."

Von Pohl, unwilling to antagonize the Kaiser, was not adverse to following the Army's lead in joint plans for bombing England. The Chief of the General Staff, Erich von Falkenhayn, thrice proposed during the fall to send the Army's Zeppelins forward to bases in Belgium, while the Navy could then use the Army's sheds in the Rhineland for joint operations. The plan failed because the Belgian sheds were still incomplete, and because the Kaiser's consent had not been obtained. The Navy was hardly prepared, either, for the first bombs—fifty 110-pounders—were not delivered until early October.

Behncke's determination to destroy London even led him to sponsor a fantastic scheme to bomb it from a free balloon. The Army's *Oberleutnant* Stein had presented a lengthly paper stating his conviction that by ascending or descending to find favorable air currents, he could reach London with such a contraption and return. On October 23, 1914, Behncke turned over to him the Navy's Field Airship Battalion. Thrice the lieutenant attempted to make the flight from a base at Wynendaele in Belgium, without success. On March 24, 1915, Stein wrote that he had not enjoyed the usual east wind which would have taken him to London, and wished to transfer to Laon in order to attack Paris. But Behncke had had enough, and withdrew his men.

Matters came to a head at the very end of the year. From all sides, the pressure on von Pohl was mounting to obtain consent for greater freedom of action for the German Navy. Strasser, growing impatient, had telegraphed from Nordholz on Christmas Day, "generally favorable weather conditions for distant undertaking against England." That morning, in fact, a handful of British seaplanes, carried close in to the German coast, had unsuccessfully bombed the Nordholz base, raising the possibility that the Zeppelins might be destroyed in their sheds before they could be used. On December 4, and again on December 19, French Voisin bombers had inflicted heavy civilian casualties in Freiburg—acts which, to von Pohl and other Germans, cried out for retaliation. Von Pohl even ordered on his own, initiative attacks by the naval airships "against English east coast with exception of London." But after discussing the matter with Admiral von Tirpitz over Christmas dinner at Imperial Headquarters, he had to agree that "a decision by His Majesty seems unavoidable," and he withdrew his permission.

"Order, counter-order, disorder!" It was too much for Admiral Philipp, who saw the Navy as the victim of Army jealousy. "Recently London, then the whole of England, was forbidden to the naval airships for special operations, because the Army is now using their airships in the ground fighting in France and apparently does not want the Navy to go ahead by itself." The Navy now had enough airships for both scouting and raids, but was being forced to let favorable weather opportunities slip by.

> If the Army uses ships in France indefinitely and the Navy is forced to wait for a plan of joint operations, the great fighting capacity of the Navy ships will remain completely unused for a long time. They will be destroyed without result by enemy plane attacks. For these reasons, and because the Army lacks a determined and expertly trained leadership, I ask that an effort be made to give the Navy a free hand in its efforts against London and the rest of England.

On January 7, 1915, von Pohl demanded an audience with the Kaiser. The heading "Air Warfare" was just one of many items on his agenda:

It is anticipated that offensive employment of the airships against England in the months of January and February will be particularly worth while, as calm and cool weather can be anticipated. Primary attack targets would be the militarily important areas of London and the military installations of the lower Thames, because of the moral impression as well as the high significance, which would not be involved in attacks on objectives of lesser importance. Historical buildings and private property will be spared as much as possible.

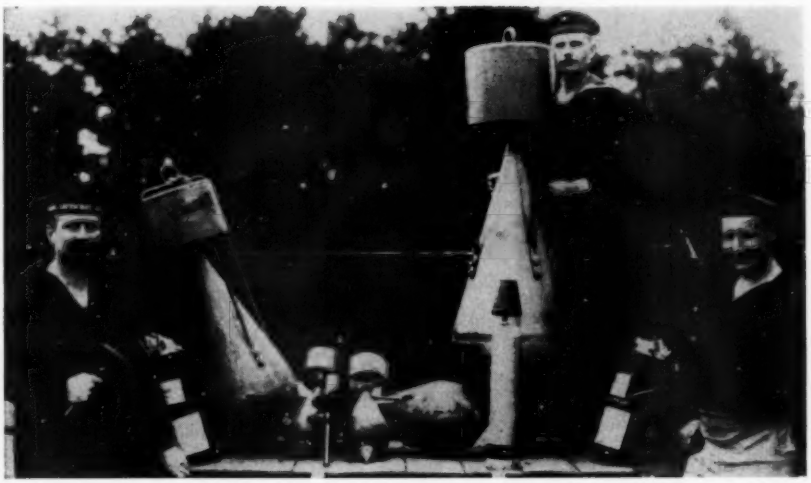
Von Pohl came away with a partial victory. "Air attacks on England approved by the Supreme War Lord," he advised the Commander-in-Chief of the High Seas Fleet on January 10. "Targets not to be attacked in London but rather docks and military establishments in the lower Thames and on the English coast." It would be some months before the Kaiser would permit attacks on the center of London.

After a false start on January 13, the first Zeppelin raid on England took place on January 19. In many ways, this initial attack foreshadowed the pattern that the airship raids would follow throughout the war. Three ships set out with high hopes, but only two made it across the North Sea. L 3 dropped six 110-pound explosives and seven incendiary bombs on the minor naval port of Great Yarmouth. L 4, after scattering her payload over rural Norfolk, caused some damage in the town of Kings Lynn. The results were inconsiderable—four killed, sixteen injured, and about 37,000 worth of damage. Both ships iced up badly on the flight home, and reached their base at Fuhlsbüttel with some difficulty. These pre-war type Zeppelins were in fact barely able to reach the nearest portion of the English coast with a minimum payload of bombs. L 4's navigation in particular was faulty, her commander believing himself to be some sixty miles to the north, over the river Humber; he learned where he had been after reading the English newspapers. Realizing then that L 4 might have bombed the royal palace at Sandringham in Norfolk, von Pohl shuddered to think that the Kaiser might forbid all air attacks. A tart note from the Chancellor, von Bethmann-Hollweg, must have caused him further distress:

> According to information received, for Zeppelins to drop bombs on apparently undefended places makes a very unfavorable impression on foreign neutrals, particularly in America. Also doubt exists in responsible circles there, as military importance and success is not readily apparent. Prompt explanation to this effect seems urgently necessary.

But the German civil population had no doubts. "It has come to pass, that which the English have long feared and repeatedly have contemplated with terror," wrote the *Kölnische Zeitung*. "The most modern air arm, a triumph of German inventiveness and the sole possession of the German Army, has shown itself capable of crossing the sea and carrying the war to the soil of Old England!" Accepting the English assertion that only two people had been killed in Great Yarmouth, and three injured, the *Berliner Lokalanzeiger* assured its readers that "after the first bomb fell the inhabitants fled shrieking into their houses and hid in the cellars. This explains the fact that although great material damage was done, only a slight human casualty list is indicated."

Further desultory raids during the spring of 1915 served to nourish Teuton hopes. Actually, these confirmed the unanticipated discovery in the first raid that the Zeppelins' navigation—dead reckoning at sea, and pilotage through identification of rivers, cities, etc., over land—was too inaccurate to enable them to find their targets. Wind directions and velocities could not be accurately measured from an airship over the sea, particularly when she was flying above clouds, hence large drift errors would make dead reckoning positions worthless. Over England at night, particularly with impaired visibility, little detail could be made out in the blacked-out countryside, and wishful thinking played a large part



BOMBS CARRIED BY THE NAVAL ZEPPELINS: 660 lb., 220 lb., 110 lb., and 22 lb. explosives, and a pair of incendiaries in the cart to right and left.

in a commander's guess as to where he was.

The need for a radio navigational aid had been forseen, and in April 1915, two direction-finding stations entered service especially to assist the naval airships. Until 1918 the Zeppelins called up the shore stations, which took bearings on their signals and radioed them to the airships. The Germans ignored the fact that the enemy could readily locate the raiders in the same manner; indeed, they grossly underestimated British Intelligence. Not only were the courses of the approaching attackers plotted in England through radio bearings, but throughout most of the war the British gained valuable information through decoding the radio signals of the Zeppelins and other naval units.

London, the prize that lured Behncke and others, was still beyond reach. On January 11, 1915, he drew up a long list of targets in London "of direct service to the war effort," which were excluded by the Kaiser's order that only the docks could be bombed. Among the public buildings which he clearly believed could be destroyed were the Admiralty and War Office in Whitehall, Woolwich Arsenal, the Bank of England, the Stock Exchange, the Central Telegraph Office, the Foreign Office, the Mint, the London railway stations, and the London Water Works at Hampton. Behncke urged particular attention to the "dangerous zone" in the heart of the ancient City of London—a square mile of inflammable textile warehouses crowded together and separated only by narrow alleys. This had been the site of a disastrous conflagration in 1897 which had not failed to impress the German military authorities, and they hoped to reproduce it by using airborne incendiary bombs.

A Top Secret order of February 12, 1915, gave ambiguous encouragement to the strategic bombing planners:

> (1) His Majesty, the Kaiser, has expressed great hopes that the air war against England will be carried out with the greatest energy.
>
> (2) His Majesty has designated as attack targets: war material of every kind, military establishments, barracks, and also oil and petroleum tanks, and the London docks. No attack is to be made on the residential areas of London, or above all on royal palaces.

The prestige value of being the first to bomb London was at this time aggravating the chronic jealous rivalry between the two air services. Though soon to be eclipsed, both in numbers and accomplishments, by the sea service, the Army was temporarily in the ascendant. Liberally interpreting the Kaiser's directive to mean that their airships could bomb targets east of a line drawn through Charing Cross Station in the center of the capital, the Army drew up a grandiose bombing plan, code-named FILM FETWA, listing all possible targets in the capital east of the bombing line. Yet the Kaiser, getting wind of the project, put his foot down, and only in May, after further pressure from his service chiefs, did he order: "London east of the longitude of the Tower permitted for air attack." The War Office, the Admiralty, the City, with the Bank of England and the Stock Exchange, remained out of reach. But the Army now had its chance. On the night of May 31, 1915, the Zeppelin LZ 38 became the first aircraft to attack the capital of the British Empire. Flying at 10,800 feet, her commander, *Hauptmann* Erich Linnarz, sent down 3000 pounds of bombs on north-east London. Several houses were destroyed, seven people were killed, and thirty-five injured.

It was a small beginning, but the British were stung into action. Seven days later Royal Naval Air Service pilots from Dunkirk bombed the first London raider in her shed at Brussels-Evere, and she went up in flames. Even more dramatic, at the same hour Flight Sub-Lieutenant Warneford in a Morane Parasol bombed LZ 37 in the air near Ghent. The Zeppelin fell burning on a convent; one of her crew servived. Discomfited, the Army withdrew its two remaining ships in the west, and the Belgian bases, only 160 miles distant from London, were not regularly used thereafter.

In the early summer of 1915 the Kaiser's scruples against bombing the heart of London were finally overcome by the new Chief of the Naval Staff, Admiral Bachmann. More aggressive than his predecessor, Bachmann was determined to attack the City, the financial center of the British Empire. He began by obtaining the support of the Chief of the Army General Staff. Then, using a French air attack on Karlsruhe as his excuse, Bachmann on July 9 attempted to get the Chancellor on his side. Bethmann-Hollweg, apparently sharing the curious Continental belief that the weekend in the country was the privilege of all classes of Englishmen, stipulated that raids on the City be made only between Saturday and Monday. Seeing that he was likely to get no real help here, Bachmann on July 20, demanded a formal audience with the Kaiser, pleading:

> But really effective attacks are possible only if the City, the heart of London's commercial life, is bombed. The Chancellor has agreed to raids on the City, but requests on humanitarian grounds that these be made only on weekends from Saturday to Monday morning, so that the buildings in the City would be unoccupied. This limitation is unacceptable because of the dependence of the airships on the weather. Every night the City empties of people regardless of the weather, also the enemy shows no regard for humanitarian behavior in attacks on Karlsruhe and elsewhere. Therefore, I request Your Majesty to withdraw this prohibition and to authorize the Commander-in-Chief of the Fleet and the Chief of the Flanders Naval Forces to designate the City of London as a target; monuments like St. Paul's Cathedral and the Tower will be spared as far as possible.

Possibly because he was genuinely affected by the argument about French air raids on the Fatherland, the Emperor gave in, and henceforth permitted air attacks on London without restriction, except that the royal palaces and historic edifices were not to be bombed.

Permission to attack the City of London coincided with the entry into service of the new million-cubic-foot Zeppelins ordered by the Navy in August, 1914—far more efficient war machines than those built to Count Zeppelin's ideas. Throwing himself into the campaign with

zeal, Strasser personally led the first squadron raid by five ships on August 9, 1915. London was not reached, and one ship was lost—L 12, damaged by A. A. fire over Dover, fell in the Channel and burned accidentally after being towed into Ostend. Nor were the succeeding attacks particularly successful.

Raids were suspended during the succeeding full-moon period—the attackers would have been too easily seen from the ground—but on the afternoon of September 8, 1915, three of the new ships set out for London. One promptly aborted ten minutes after take-off, the second barely reached England and limped home with two of her four engines dead; but the third, L 13, was commanded by Heinrich Mathy, an officer with two years' experience in Zeppelins, a bold and determined flier, an inspiring leader, and a navigator of uncanny skill, who that night was to strike the most devastating blow of the war against London. Coming in over the coast of northern Norfolk at dusk, Mathy carefully checked his position and found his way, guided by the lights of villages below, to Cambridge. From here it was easy to find the target, for the lights of London, poorly blacked out, lit up the southern horizon from sixty miles away. Coolly withholding his bombs in the face of anti-aircraft fire, Mathy, who had learned his way around London during a week's visit in 1909, dropped the bulk of his cargo—including the first 660-pound bomb carried to England—in the heart of the City. For the first and last time, Admiral Behncke's dream of starting a conflagration in the "dangerous zone" was coming true. Though Mathy failed in his very determined attempt to hit the Bank of England and Liverpool Street Station, his incendiaries started raging fires that consumed blocks of warehouses north of St. Paul's Cathedral, for a total monetary loss of nearly two-and-a-half million dollars. The sensation was painful—if one Zeppelin, carrying only 4000 pounds of bombs, could wreck such destruction in one night, could air power win the war in spite of the Royal Navy? In the political upheaval that followed, the London defences were reorganized and a retired Royal Navy gunnery expert, Admiral Sir Percy Scott, was put in charge. And yet, while Mathy was telling an American reporter that he had never been bothered by airplanes and was not afraid of them, Scott foresaw that the night fliers would be "the Zeppelins' worst enemy."

But a full month, and more, passed before the Zeppelins came back to London. This time it was Joachim Breithaupt in L 15 who sowed fire and destruction through the heart of the capital. The British were puzzled that Breithaupt, flying over the Admiralty building, dropped his first bombs a third of a mile to the east in the theater district. Asked about this forty-five years later, he replied:

> I clearly saw the Admiralty underneath me close by the big bridge, and attempted to hit it, but apparently we aimed the bombsight at the bridge 500 meters east of the Admiralty near Charing Cross.

The damage was less than in Mathy's spectacular fire raid, but the casualties were higher—38 killed and 87 injured—a greater toll in proportion to the number of bombs dropped than in any other airship raid of the war. The results reflected credit on the daring and skill of Breithaupt and the other commanders flying in the raid, but the German government press bureau, in a release designed to encourage the home front, prefaced a long list of false and exaggerated claims with the assertion that:

> The whole series of reports from the English side concerning the last air raid have, as usual, limited themselves to giving the customary number of human lives as the sole cost of the raid, and have minimized the material damage as completely insignificant. All efforts of the Government to conceal the damage actually caused, by extensive censorship and deliberate confusion in the *communiqués*, have this time likewise been unsuccessful. The destruction which resulted from the last attack cannot be concealed for long. The whole extent of the damage cannot

be completely ascertained, but it is sufficient, from what is already known, to state that the air raid of the 13th/14th October far exceeds all previous ones in its results.

Yet another six months would pass before the raiders would again try to attack London, and nearly a year before a Zeppelin—again it would be Mathy's—would drop bombs in the heart of the capital.

If 1915 had been the year of experiment, 1916 was the year of all-out effort. Despite post-war statements to the effect that scouting at sea was the Zeppelins' primary mission, the record shows that in 1916, the year in which the High Seas Fleet fought the Battle of Jutland, scouting was subordinated to bombing England. In 1915, 297 scouting flights had been made on 124 days in the North Sea, and 47 sorties against England. In 1916, there were only 253 scouting flights on 89 days, and no less than 187 bombing sorties.

The chief reason for the Zeppelins' being released in an intensive, all-out raiding effort was that Strasser had at last found backing at a high level from the new Commander-in-Chief of the High Seas Fleet. Succeeding to the post on January 18, Vice Admiral Reinhard Scheer was determined to use more aggressively against England every weapon that lay to hand, and while the Kaiser's veto still prevented him from turning the U-boats loose to wage unrestricted warfare against merchant shipping, his bold excursions with the surface forces soon led to the only fleet action of the war at Jutland. Strasser's unswerving faith in his Zeppelins as strategic bombers found an enthusiastic response from the new Fleet commander, and his respect for Strasser's energy and ability developed in the next two years into friendship and admiration that meant much to the Leader of Airships personally, and to the arm he represented.

Their first official meeting occurred on the very day that Scheer was confirmed in command of the Fleet. A plan was outlined for intensified air attacks on the whole of England. Raids were to be made by as many airships as possible, and Army Zeppelins were to participate (they rarely did), coordination being arranged at the highest level between the Chief of the Naval Staff and the Chief of the General Staff. England would be divided into three areas, for the purpose of issuing simple attack orders.

"England North" would mean Edinburg and secondarily the Tyne.
"England Middle" would mean Liverpool and secondarily the Humber.
"England South" would mean London, secondarily Yarmouth, etc.

The campaign against the Midlands commenced two weeks later, on January 31, 1916, when nine of the large standardized naval Zeppelins, led by Strasser in person, departed from the North Sea bases with orders "if at all possible to attack Liverpool." Ground fog, the inaccuracy of radio bearings, and the blackout, which was better in some industrial cities than in others, rendered navigation unusually difficult. Significantly, though the Zeppelin commanders claimed to have bombed Liverpool twice, Sheffield three times, Manchester twice, and Nottingham, Goole, Immingham, and Yarmouth once each, not a single bomb fell in any of these towns. But there were heavy civilian casualties in the suburbs of Birmingham and in the unfortunate town of Burton-on-Trent, which, showing lights, was attacked three times. The defences in the Midlands were practically nonexistent, and the giant raiders moved wherever they pleased, one remaining over English soil for nine hours. So far the Midlands had been largely spared; now there were cries of anguish and protest, and for the first time, the War Office was moved to set up a coordinated system of searchlights, antiaircraft guns and night flying aircraft to cover the entire country.

The spring raids covered the entire island, from Edinburgh in the north to the approaches to London in the south. Yet, though the Zeppelins were out in full force during every moonless period, bad

A CORNERSTONE OF AIR POWER IN WORLD WAR I: Nordholz, one of the larger naval airship bases on the North Sea coast.

visibility, navigational difficulties, and the blackout caused most of their bombs to fall in open country. The guns, also, were demanding respect. In an attempted raid on London on March 31, 1916, Breithaupt's L 15, repeatedly hit, fell in the Thames Estuary while trying to make Belgium, while Mathy was lucky to get home to Hage in L 13 with two gas cells badly holed. This raid, in which seven ships participated, caused damage of only $93,000, with 48 killed and 64 wounded. All the more astonishing, therefore, is the official report covering this raid, apparently based on communications from agents, which the Chief of the Naval Staff presented to the Kaiser on April 11, 1916:

> At Grimsby, in addition to the post office and several other houses, a battleship in the roadstead was heavily damaged by a bomb, and had to be beached. At Kensington an airplane hangar was wrecked, near Tower Bridge a transport ship damaged, in Great Tower Street a factory was wrecked, and north of the Tower a bomb fell in George Street only 100 meters away from two antiaircraft guns. It was reported that a big fire had broken out at West India Docks, and that at Tilbury Docks a munition boat exploded (400 killed). Specially serious explosions occurred at the Surrey Commercial Docks and at a factory, close to the Lower Road, at which shells were filled with explosives. A railroad train already loaded with these shells was stated to be completely wrecked.

Not one single word of this was true, but the fact that it was believed, not only by the deluded populace, but also by the Supreme War Lord and his responsible advisers, underlines the role of wishful thinking in determining high national policy. Believing that England was tottering under his blows, Strasser was ready to redouble his efforts.

The shortness of the nights in June and July forced a suspension of Zeppelin attacks on England, but in the late summer they were back, more confident than ever. For the "super-Zeppelins," as the British called them, were ready at last after only ten months of development—giants of nearly 2,000,000 cubic foot capacity, 650 feet long, 78 feet in diameter, with a gross lift of 70 tons. Deducting the dead weight of structure, 25

to 30 tons of useful lift remained. The loads they could carry are impressive even today—in raids on England, six and a half tons of gasoline, enough to last 21 hours; 1300 pounds of oil, ten tons of water ballast, and over 9000 pounds of bombs. The first of these monsters, L 30, was completed on May 28, 1916, and Heinrich Mathy commissioned the second, L 31, on July 17.

Strasser had the most sanguine hopes, and after flying to England in L 31 (she was only briefly over land near Lowestoft, and dropped no bombs), he wrote to Scheer:

> The performance of the big airships has reinforced my conviction that England can be overcome by means of airships, inasmuch as the country will be deprived of the means of existence through increasingly extensive destruction of cities, factory complexes, dockyards, harbor works with war and merchant ships lying therein, railroads, etc. . . . .
>
> The number of airships cannot be estimated high enough for a quick and effective conquest of England. In the interest of a prompt and victorious ending of the war, attacks must be made with all the airships the building works can produce.
>
> I therefore respectfully request the Imperial Command to effect an increase of the establishment of airships assigned to the Imperial Command from 18 to 22. . . .
>
> The above proposal naturally requires an early increment of 4 airship crews with 4 commanders and 4 executive officers.
>
> I am well aware of the generally prevailing personnel problems, but believe that the personnel must be made available, if necessary, through reduction in other areas, since the airships offer a certain means of victoriously ending the war.

Yet the Zeppelins, unknown to Strasser, were facing their greatest defeat. At long last the British, realizing that the surest way to destroy the Teuton war dragons was to set fire to their inflammable hydrogen, had developed an incendiary bullet for aircraft machine guns. The Royal Flying Corps' handful of night flying pilots were about to score a decisive success, and the Zeppelin menace would never again be the same.

On the night of August 24, 1916, Mathy's L 31, alone of twelve Zeppelins, slipped up the Thames, and, skillfully using heavy rain-clouds for cover, salvoed her bombs into the southeastern districts of London and was away before the searchlights could locate her. The damage toll of $624,000 exceeded that for any airship raid except Mathy's own of September 8, 1915. In a supreme effort, twelve Navy and four Army airships set out for London on September 2, 1916—the only time throughout the war that Army and Navy craft attacked the same target simultaneously. The wooden-girder Army Schütte-Lanz SL 11, based on Spich near Bonn, beat the Navy rivals to the capital. Her commander, *Hauptmann* Wilhelm Schramm, paid for his temerity by being the first victim of the night pilots; Second Lieutenant William Leefe Robinson, flying a B.E. 2c, set her afire at 12,000 feet, and she fell in flames at Cuffley while millions of excited Londoners cheered themselves hoarse. The Navy commanders, who had seen the awful portent flaming in the sky, went on to claim attacks on London, but the capital was not bombed. Both morally and materially, the Germans were the losers: 4 English civilians killed, 16 wounded, and $100,000 worth of damage could not balance the loss of the Army Schütte-Lanz which cost the German taxpayers about $450,000, and her trained crew of 16 men killed.

The Army never again tried to attack London, but the Navy, still confident in its magnificent super-Zeppelins, was not ready to quit. On the night of September 23, 1916, while eight of the older airships raided the Midlands, Mathy in L 31 led L 32 and L 33 across Belgium to attack London from the south. In a bold, high-speed run at 12,000 feet, Mathy crossed the capital from south to north—the first time this had been done—and with his proverbial luck, got away unscathed. His four-and-a-half tons of bombs caused heavy casualties south of the Thames, but

bad visibility, apparently, prevented him from seeing and bombing the City of London, as he claimed in his raid report. Simultaneously, L 33 appeared over eastern London and started some bad fires, but took fatal punishment from the guns—one shell exploding inside a gas cell—and was forced to land near the coast. Her warped skeleton served as a pattern from which the British built several copies, including the transatlantic R 34. L 32 did not reach the capital, but was caught by a plane as she was crossing the Thames to the east and shot down in flames.

It was a saddened and temporarily chastened Strasser who sent out L 30 and L 31 two days later to attack London "with the limitation that caution is ordered in case of clear weather." Finding no cloud cover over London, Mathy went down-Channel to Portsmouth. Less than a week later, pushing his luck too far in one more attack on the enemy capital, Mathy went down in flames at Potters Bar. So died "the greatest airship commander of the war," still believing to the end in the superiority of his weapon; and after his death, no other Zeppelin ever flew intentionally over London.

In the last raid of the year, on November 27, 1916, the ten airships restricted themselves to the Midlands and the North, but this did not save them, for the planes scored a double—L 34 shot down in flames off Hartlepool, and L 21 early next morning off Lowestoft. Thus the year 1916, the year in which the Zeppelin raiders made their greatest effort, ended on a note of defeat. In 1915, the damage done had amounted to $3,916,156. The much larger bombing force over England in the year 1916 achieved a damage toll of only $2,853,710, while the casualties had only slightly increased. Only one airship had been lost in the 1915 raids on English targets, while in 1916 the improved defences had accounted for a total of seven.

The Army, abandoning the inflammable monsters, turned to the Gotha bomber and with it, in 1917, wrote a new chapter in strategic bombing history. Strasser, however, persisted in his faith in the Zeppelin, and with Scheer's encouragement, imposed his views on the German Admiralty and Naval Staff. Arguing successfully that the raids must continue in order to pin down planes, guns, and men in England, and that only the airships could reach the cities of the Midlands and the north, he proposed to continue raiding with his Zeppelins drastically lightened in order to reach altitudes of 16,000 to 20,000 feet. The story of the daring and imaginative engineering advances undertaken to attain such altitudes in the last two years of the war is a true technological romance. Though the ships were still the same in size and general layout, the metal hull structure was ruthlessly lightened up until the safety factors approached 1, and the crews had to be cautioned against sharp manoeuvres at low altitude that might break the ship in two. Lighter fabric was used for outer covers, and the gas cells themselves were lightened by substituting silk for cotton, and using only two layers of gold beaters' skin instead of three. The crews were carefully weeded out, and only the fittest were retained to face the rigors of the sub-stratosphere, where temperatures could—and did—fall to 40 below zero F. At high altitudes the conventional Maybach engines lost up to half their power. An "altitude motor," supercompressed, with oversize pistons and cylinders, was designed to increase the power at altitude — no turbo-superchargers had been developed—but it was not ready until November, 1917.

Thus, when the Zeppelins next appeared over England on the night of March 16, 1917, the defending airplanes, with their ceiling of around 12,000 feet, found themselves outperformed. L 35's maximum altitude was 18,400 feet; L 40 touched 19,000 feet, and L 41 reached 17,100 feet. But they had escaped one enemy only to meet another: an unforseen gale from the north, which they could not stem with the loss of engine power at high altitude, whirled them south over France. "Altitude sickness" among the crews contributed to re-

peated motor breakdowns. With her engines frozen, L 39 drifted at daybreak over Compiègne and was set afire by French antiaircraft guns. In England there were no casualties, and the 79 bombs on land caused only $782 worth of damage.

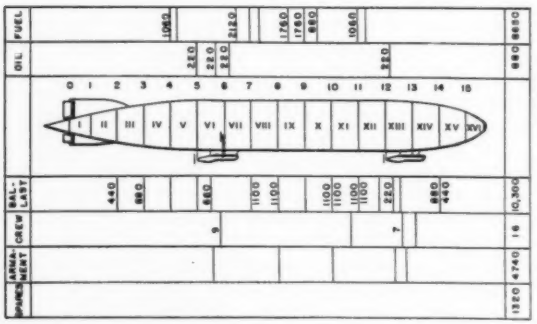
Later high-altitude raids, while demonstrating the self-sacrificing devotion of the airship crews in the face of incredible hardships, were equally devoid of military results. Yet Strasser wrote to Scheer on June 23, 1917:

> . . . . The airship successes of the past months justify also the firm and energetic continuation of attacks on England.
>
> Airship development has followed correct lines. The modern airships have an attack altitude of 6000 meters (19,700 feet) with a bomb load of 3000 kg. (6600 pounds). The difficulties lie in preventing engine failure. Material failures are involved, but the chief cause of such failure is failure of personnel.
>
> Prolonged flying at high altitudes places a great strain on the motivation of each individual. Therefore, from commanding officer to machinist's mate, only personnel with the highest *morale* can be used.
>
> By carefully weeding out undesirable elements a great deal can be accomplished here. . . .
>
> On the other hand our experience with oxygen is not yet extensive. Provision of large oxygen units which will provide each man with a sufficient and long-lasting oxygen supply is necessary and will be attended to. . . .
>
> The airship attacks on England constitute a burden on our main opponent not to be underestimated.
>
> How disturbing these attacks are for the English is shown by the tremendous expense they go to to prevent these attacks, and by the jubilation demonstrated when an airship is destroyed.
>
> The deliberate minimizing of the effects of the attacks by the English press in my opinion is designed, in conjunction with our losses, to cause us to be doubtful of their success.
>
> If the English should succeed in convincing us that the airship attacks had little value and thereby cause us to give them up, they would be rid of a severe problem and would be laughing at us in triumph behind our backs.

Recklessly sending out four airships on June 16, 1917—one of the shortest nights of the year—Strasser had suffered a painful blow when the flagship of the raiding squadron, the newest of the "height-climbers," L 48, was shot down by an English plane near Harwich. On board was his trusted subordinate, *Korvettenkapitän* Viktor Schütze, the Commander of the North Sea Airship

15TH FLIGHT

BALLAST SHEET FOR AIRSHIP "LZ45" "L13"



	LB		LB.
FUEL	8650	PASSENGERS	
OIL	880	PROVISIONS	
18 CREW	2820	ARMAMENT	
BALLAST	10,300	AMMUNITION	4740
STORES & SPARES	1320	BOMBS	
DEF. LIFT	880		
SERVICE LOAD	24,850	USEFUL LOAD	4740

ADDITIONAL LOAD (DEW, RAIN, SNOW) _____ LB.

USEFUL LIFT WITH 100% FILLING 29,590 LB

AIR:	GAS:
BAR. = 30.30 IN.	T. = 69.8°F.
T. = 63.5°F.	SP. GR. = 0.0930
REL. H. = 70%	

ADDITIONAL FILLING _____ CU. FT.

HAGE, SEPT. 8, 1915.

WEIGHED OFF BY
FRIEMEL
OBLT. Z. S.

THE COMMANDER
MATHY
KAPITÄNLEUTNANT

REDUCED USEFUL LIFT 32,650 LB.

Division. Remarkably, two of the crew survived—one of them falling nearly three miles inside the flaming hull, walked away with only superficial burns.

Though Scheer still had absolute faith in the Zeppelin as a raider and as a scout for the Fleet, the "Victor of the Skagerrak" did not prevail in a clash with General Erich Ludendorff in the summer of 1917. Wishing to preserve Germany's insufficient aluminum and rubber for his "Amerika" program of expanded aircraft production, the General proposed that the Navy's airship program be halted completely. Scheer, arguing the need to continue raids on the industrial Midlands and north of England, insisted that the Navy must maintain an establishment of 25 airships, with one new Zeppelin per month. The fight was carried to the Kaiser, who on August 17, 1917, decided that the Navy should receive only one new ship every two months, and that henceforth the airships would generally be used for scouting only.

The last big raid of the war, on October 19, 1917, was an appalling tragedy which demonstrated the helplessness of the underpowered "height-climbers" against the savage storms of the upper air. Eleven Zeppelins set out, all of them reached England, but on ascending to their attack altitudes, they found themselves in the grip of a fierce northerly gale. Heading into the wind with wide-open engines, the Zeppelins made sternway southward. L 45, thinking herself still over the Midlands, found herself unexpectedly driving across London; three of her 660-pound bombs on the capital caused most of the casulaties of the raid. Only one ship returned home by the usual route across the North Sea. Two more made it across neutral Holland. Of the eight Zeppelins blown over France, one was shot down in flames, and three were forced to land after repeated engine failures and with fuel exhausted. One more ship became lost over Germany and was wrecked in a forced landing.

Three months later, five more airships were destroyed in a series of unexplained explosions at the giant Ahlhorn base, which also wrecked the four huge double sheds housing them.

Thus, it was as a shadow of its former self that the Naval Airship Division continued attacks on England in the last year of the war. Coming by choice on dark, thick, cloudy nights, when defending aircraft could not find them, the handful of Zeppelins still raiding could not see their targets either. Bombing usually was by radio bearings alone—often 30 to 40 miles in error. On one night in April 1918, five ships were out, one dropped three tons of bombs between Birmingham and Coventry, and another nearly became the first to attack Liverpool. Ten miles southeast of the seaport her commander turned away to bomb Wigan, which he thought was Sheffield! The British had had a bad scare, but no appreciable damage had been done.

Strasser's death in action in the last raid of the war, on August 5, 1918, has been labeled a desperate suicide venture by a man who knew he was beaten. The record demonstrates on the contrary that he was so blinded by his habitual overestimation of the airship as to be oblivious to his coming doom. A bare four weeks earlier the new L 70 had entered service, the first of a new class of Zeppelins far superior in performance to the hapless craft that had been blown over France eight months before. Designed to attain 21,200 feet statically with four tons of bombs, she was there able to make 70 miles per hour with seven Maybach "altitude motors." Strasser's enthusiasm for the splendid new giant knew no bounds. Others, who could see more objectively the tremendous advances in airplane performance in the past four years, were more skeptical. Admiral Starke, heading the Aviation Department at the German Admiralty, recalled later that on July 28, 1918:

> I had a conversation with Captain Strasser in which he spoke of the L 70 as the final type. He tried to convince me that the danger of aircraft to this ship

was not great. Here I could not agree with him. I told him I did not feel the L 70's performance was sufficient protection against attacking aircraft and on this account the Admiralty was ordering the experimental ship L 100. He then assured me that he could not use a ship that could not be housed in the revolving shed. He brought up every possible argument against building the experimental ship.

Strasser's raid order shows that he still dreamed of bombing London: "Attack on south or middle (London only at order of Leader of Airships)." Whatever doubts may have plagued the other commanders, there was no lack of confidence in the control car of L 70. For the command of this fabulous ship had been given, not to one of the veteran officers, but to a favorite of Strasser's who had made only a handful of "war flights" in the Baltic. Rash, inexperienced, in a hurry to make his reputation in the North Sea, *Kapitänleutnant* Johann von Lossnitzer, making his first raid on England, was not the man to urge caution and prudence on his chief.

Thus was determined the fateful rendezvous off the coast of Norfolk, when L 70, leading the raiding squadron westward in the twilight at only 17,000 feet, met two experienced Zeppelin-killers in a Rolls-Royce Eagle-powered DH 4 with a ceiling of 22,000 feet. A brief burst of incendiary ammunition, and flame raced from end to end of the 693-foot flagship. Only a jammed gun prevented the Britishers from serving L 65 in similar fashion. The other Zeppelins turned back, dropping their bombs, they reported, according to radio bearings. None fell on land.

This was the end. Strasser was dead, and Scheer, his patron, had left the North Sea to be the last Chief of the Naval Staff. Plans were indeed drawn up for a new craft rivaling the later "Graf Zeppelin" in size, able to reach 26,200 feet statically and there able to make 68 miles per hour. But a month later this new L 100 was cancelled. No more scouting flights were ordered. The hydrogen-filled airship as a bombing weapon was through as far as its creators were concerned, and only the post-war need to prove that Germany had won the war after all prevented them from admitting it.

What was the promise, and what was the performance, of the rigid airship as a weapon in World War I? "The bombs on England had little material effect," admits Martin Dietrich, who commanded five naval airships. "But the moral effect was something else. It was important to remind the English that their island empire was no longer safe from attack—attack from the air." In other words, the Zeppelin airships are seen in the end as a psychological weapon, and their effect was most largely in the minds of those who possessed them and of those who were subject to the threat of their attacks.

The Germans grossly overestimated the psychological effect on the average Britisher, as when Admiral Behncke anticipated that the raids might "cause panic in the population which may possibly render it doubtful that the war can be continued." Yet the Zeppelin attacks, and the blackouts which resulted, not only considerably disrupted war production but brought with them a nameless terror, an imminent awareness of danger, which contributed to war-weariness on the home front.

The popular conviction that in the Zeppelin they possessed a magic weapon which would destroy their enemies' cities was a significant factor in maintaining German morale until the heavy losses in the fall of 1916. Disillusionment thereafter was extreme and almost universal. Students of psychology, contemplating the German *Kulturgeist* in action, have postulated a deep-seated national inferiority complex. For such insecurities the sight of the Zeppelin in the sky, the *Kolossal* symbol of Teutonic supremacy, must have been an unrivaled antidote—until its weaknesses could no longer be denied.

The Zeppelin's real achievements as a strategic bomber were mere pin-pricks compared to the aerial devastation in World War II. In 51 raids on England,

5,806 bombs were traced by the British, weighing a total of 196 tons in round figures. 557 people were killed, and 1,358 injured. The total damage done by the airship raiders throughout the country amounted to $7,332,408, including $4,080,523 in the County of London. At the end of 1916, twelve Royal Flying Corps squadrons, and 17,341 officers and men were retained in England for home defence.

For these results the Germans paid a high price. During the war years, the Army commissioned 37 rigids (many of these serving on the Russian front and in the Balkans), losing three in connection with the raids on England. The Navy placed in service 73 airships, including 37 Zeppelins of the largest size, and lost 16 of them in attacks on England. The smaller craft of the L 10 type cost about $325,000 each; the later and larger ships about $780,000. In addition, the Navy ordered and built after war's outbreak 14 small single hangars, and 15 sheds for large ships, the majority of which were double.

Perhaps hardest to bear was the high cost in personnel, directly attributable to the Zeppelin's susceptibility to fire. Even in the submarine service the losses were not so high in proportion. Of the 50-odd Navy flight crews trained during the war, about 40% were killed in combat or in flight operations—40 officers, 34 warrant officers, 264 petty officers and 51 enlisted men. Army losses were 16 officers and 37 men.

The alleged primary mission of the Navy's Zeppelins was reconnaissance at sea, and yet, when War Diary figures demonstrate that they covered the German Bight on only one day in four, one wonders again whether the expenditure was justified. Yet the narrow North Sea, where scouting flights lasted no more than 20 hours, was not the proper theater for the larger rigid airships. Loaded to capacity with more than thirty tons of gasoline, the 1917 and 1918 "height-climbers" would have had a range of 3000 miles—enough to enable them to cruise for several days in the Atlantic. What could they not have done to aid the U-boat war by directing their submarines onto Allied convoys. Instead, carrying three tons of bombs and 27 tons of water ballast, they were sent out in ineffective high-altitude raids against England. The charge that the Germans failed to exploit the true capabilities of the rigid airship as a long-range scouting craft of great endurance is a fair one.

From the war elephants of Carthage, through the galleons of the Invincible Armada, to the "impregnable" Maginot Line, nations have pinned their faith on weapons which have symbolized their unique sense of national pride and power. The Zeppelin in World War I satisfied deep-seated emotional needs, yet disappointed the extravagant hopes and dreams of the German people. Human nature being what it is, and other nations not being immune to self-deception, the pattern may repeat itself, with other weapons being endowed with magic properties and attributes which the test of combat will show that they do not possess.

AIR WAR OVER EUROPE

In the attack by Allied air power, almost 2,7000,000 tons of bombs were dropped, more than 1,440,000 bomber sorties and 2,680,000 fighter sorties were flown. The number of combat planes reached a peak of some 28,000 and at the maximum 1,300,000 men were in combat commands. The number of men lost in air action was 79,265 Americans and 72,281 British. (U. S. Strategic Bombing Survey)

AMERICAN AIR TRANSPORT AND AIRPOWER DOCTRINE IN WORLD WAR II

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HISTORIANS INTERPRET air transportation's role in World War II in many ways. All concur in the view that it played an important, perhaps even vital, part in the struggle against the Axis. They do not agree, however, as to the nature and cause of success itself.

The manner in which air-borne supply evolved in wartime is well known. The operations of Ferry Command, Naval Air Transport Service, and Air Transport Command are a matter of record, revealed by competent historians who performed their tasks well.[1]

The purpose of this paper will be to inquire in depth into the factors which made possible the remarkable achievements of military air transportation. In part, other historians have taken the path chosen here, but they have invariably stopped short of important elements.

Two points of view generally prevail at the present time. One group attributes success to the genius of military planners, particularly Generals H. H. Arnold and Harold L. George, commanders, respectively, of the U. S. Army Air Forces and Air Transport Command.[2] The leading delineator of this view is Oliver La Farge who, as chief historian of the cargo-carrying agency, became intimately acquainted with its men and operations. He writes, therefore, with the authority of a participant.

The principal spokesman for the second view is Reginald M. Cleveland, veteran writer, reporter, and expert on civil and military aeronautics. He attributes the success of wartime air transportation to aid given in the emergency by the domestic and international airlines. Accordingly, the aircraft, pilots, navigators, communications, and operations personnel, plus the unlimited knowledge of airports, routes, cargo handling, and meteorology, which only the airlines could contribute, made the difference between success and failure.[3]

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[1]Books consulted by the author include Reginald M. Cleveland, *Air Transport at War* (New York and London, 1949), Ernest K. Gann, *Fate Is the Hunter* (New York, 1961), Carroll V. Glines and Wendell F. Mosely, *Grand Old Lady: Story of the DC-3* (Cleveland, 1959), James Lee, *Operation Lifeline* (Chicago, 1949), Oliver La Farge, *The Eagle and the Egg* (Boston, 1949), Clayton Knight, *Lifeline in the Sky: The Story of U. S. Military Air Transport* (New York, 1957), and Lou Reichers, *The Flying Years* (New York, 1956).

[2]See La Farge, *The Eagle and the Egg*, pp. 7, 29 for brief statements of the role played by military planners.

[3]See Cleveland, *Air Transport at War*, pp. 28-29.

Each of these two interpretations recognizes some truth in the other. They are not poles apart. One credits success to military planners, with a strong assist from airlines. The other recognizes a certain genius in military men, but identifies it with wisdom to accept the resources and experience of the air transport industry. More moderate, and probably more accurate, judgment would incorporate the main threads of both with still other factors. A brief survey of the manner in which military air transport evolved during World War II will support this argument.

The extent to which the peacetime Air Corps recognized the value of air transportation and prepared for its expansion in wartime must be determined in the first part of this investigation. Did the air force maintain in the prewar years the personnel, equipment, and other facilities which could form the nucleus for enlarged operations during a national emergency?

Well organized air cargo operations commenced in 1930, to forward supplies from Dayton, Ohio, to other air depots charged with overhaul and maintenance of aircraft. The Fourth Transport Group established the military airline using Bellanca single-engine craft.[4] In the late 1930's, Field Service Section of Materiel Division, a unit of Materiel Command with Headquarters at Wright Field, took over the cargo airline, to serve air depots as well as base maintenance units.[5]

In October, 1941, less than two months before Japan forced the United States into World War II, Air Service Command superseded the older service organization. The new agency, with headquarters also at Wright Field, became the "quartermaster corps of the Army Air Forces," with authority to supply and store materials essential for its primary function—the repair of aircraft.[6] The Fiftieth Transport Wing, with about sixty Douglas C-33 and C-39 transports, expedited the movement of material and personnel between the parent command and subordinate units throughout the country and the Panama Canal Zone.[7] That fleet of twin-engine transports was the largest single air freight system—military or civilian—in the Western hemisphere. But it existed almost solely for the support of a single phase of the air force's activities.

Ferry Command, activated in May 1941, gave the air arm a transportation system in name, if not in fact. That organization was assigned two functions: to ferry aircraft from American factories to points of "ultimate take-off," where British crews were to assume responsibility for shipment overseas or to Canada; and to develop facilities for movement of cargo and personnel by air, as required by the air force.[8] From the second of its assigned functions, came the authorization and inspiration for a military airline.

Ferry Command remained in existence only a year, during which time its meager personnel and equipment was devoted largely to ferrying of aircraft. In July 1941, it did establish the so-called "Arnold Line" between Washington, D. C. and the British Isles, using modified Consolidated B-24 bombers to expedite the movement of officals and mail. Ambitious plans for additional routes to

[4]Testimony of Col. Hugh J. Kerr (USA, Ret.) before the subcommittee of the Senate Committee on Military Affairs, August 3, 1942. See U. S. Senate, "Hearings on S. J. Res. 156," 77th Cong., 2nd Sess., pp. 79-80.

[5]The development of Air Corps service units is traced in John M. Coleman, *The Development of Tactical Services in the Army Air Forces* (Morningside Heights, New York, 1950), pp. 4-5. See also Leonard Eiserer, "Army Air Corps Outhauls All Domestic Carriers in Volume of Freight Shipments," *American Aviation*, Vol. V (August 1, 1941), p. 6.

[6]La Farge, *The Eagle and the Egg*, p. 56; *American Aviation*, Vol. V (December 1, 1941), p. 16.

[7]Eiserer, "Army Air Corps Outhauls All Domestic Carriers in Volume of Freight Shipments," p. 6.

[8]La Farge, *The Eagle and the Egg*, pp. 11-14; Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II* (Chicago, 1948), Vol. I, pp. 313-316; Reichers, *The Flying Years*, pp. 12-13.

distant areas of the world failed to materialize, but special flights blazed trails destined to become part of a global system of military airways.[9]

On December 7, 1941, neither Ferry Command nor Air Service Command possessed the men and planes to provide the air transportation facilities required by the United States as a belligerent, and the critical shortage applied to combat as well as supporting units. In the previous two years of the national defense build-up, the proposed size of the air force had increased at an accelerated pace. Between mid-1940 and August 1941, planned strength rose from 54 groups, comprising 220,000 men and nearly 13,000 planes, to 239 groups and 108 separate squadrons, made up of more than 2,000,000 men and 63,000 aircraft.[10] While the ultimate objective was a balanced air arm, including units for movement of supplies and personnel, the initial phase of expansion necessarily emphasized training.

The enormous gap between the number of air transport craft needed and those actually available in early 1942, created widespread alarm in the press. Angry cries of negligence and mismanagement were not quieted until Congress revealed the true facts in a highly publicized investigation. During an appearance before a subcommittee of the Senate Committee on Military Affairs, August 5, 1942, General Arnold defended the air force's policy on aircraft procurement.[11]

> When we went into this expanded program to develop an air force, it was necessary to create means of training pilots, because it takes longer to train the pilots and to create units than it does to build the airplanes. We have to have a base for training personnel large enough and broad enough to take care of any demand made on it, so naturally we had a larger proportion of training planes during the first period [of the national defense program] than we did at any other time.
>
> The output of combat planes . . . was dictated to us, as you know, more by what our Allies wanted than what we wanted, because they wanted the airplanes right then to keep from losing the war . . . Now our program has been rounded out, and with the rounded-out program, cargo planes are being stepped up as rapidly as possible to come out along with other types.

Critics of the Army's program should have known that General Arnold favored air transportation on a large scale. Before assuming the post of Chief of Staff for the Air Corps in 1938 he had written, with Ira C. Eaker, a widely-read evaluation of strategy in which the merits of tactical air transport were clearly emphasized.

Cargo and troop-carrying aircraft, Arnold and Eaker insisted, were essential elements of a balanced air arm. Germany had developed a new technique in Norway and the Netherlands, employing airplanes to place infantry "at important localities to hold flying fields and key points," and in supporting ground units "where no other troop transport was available."[12] The American air force, the authors said, must expand its fleet of Douglas C-33's and Beechcraft C-45's, and develop even larger freight- and personnel- carriers to accommodate thirty to fifty fully equipped men or, should the need arise, tanks and other vehicles. Because efficiency depends on adequate maintenance and supply, cargo planes "must always be considered an integral and important part of any well-rounded and completely developed air force."[13]

In the early months of 1942, severe shortages of men and equipment pre-

[9]La Farge, *The Eagle and the Egg*, pp. 15-17, 24-27; Craven and Cate, eds., *The Army Air Forces in World War II*, Vol. I, pp. 318-321; Reichers, *The Flying Years*, pp. 173-247.

[10]Alfred Goldberg, ed., *A History of the United States Air Force, 1907-1957* (Princeton, N. J., 1957), pp. 48-49.

[11]U. S. Senate, "Hearing on S. J. Res. 156," 77th Cong., 2nd Sess., pp. 114-115.

[12]H. H. Arnold and Ira C. Eaker, *Winged Warfare* (New York and London, 1941), p. 122.

[13]*Ibid.*, p. 18.

cluded rapid expansion of air transportation to satisfy rising demands for movement of supplies and men overseas. Still another serious obstacle was a bitter quarrel between the two principal cargo-carrying agencies. Fundamental differferences in philosophies caused this antagonism. Air Service Command chose to see, as its main function, support of subordinate units. Ferry Command, on the other hand, had always served a wide clientele, acting as "an agency for the service of the whole war effort."[14]

Confusion and mismanagement resulting from divided command prompted General Arnold to take action in mid-1942. Army Air Force General Order No. 8, effective July 1, 1942, created the Air Transport Command to absorb the activities and facilities of Ferry Command; Air Division of the Transportation Service, Services of Supply; and Cargo Division, Air Service Command. The new agency was made responsible for: (1) all air transport and civil air carriers, including priorities, except those under the jurisdiction of the Navy; (2) ferrying of all aircraft to destinations throughout the world; (3) transportation by air of personnel, material, and mail for all Army agencies; and (4) control, operation, and maintenance of establishments and facilities on air routes outside the United States under the direct authority of the Commanding General, Army Air Forces.[15]

Centralization of authority was a major turning point in the struggle for effective military air supply and troop movement. Strategic air transport could be controlled, henceforth, by the agency which determined strategy.

Air Transport Command was to become operator of the world's largest airline. Initially its equipment consisted of about one hundred and twenty twin-engine Douglas transports and twenty-four four-engine craft of several types.[16] Three years later, when at peak strength, its force of 3,700 planes were moving personnel and material over a vast system of routes which, if formed in a single unit, would have circled the world more than six times.[17]

The air-borne supply system became the "lifeline" of the Allied Nations, over which cargo moved in a steady flow across oceans, jungles, mountains, and deserts. By the close of the conflict against the Axis, Air Transport Command had carried 4,198,063 passengers and 319,401 sick and wounded over 1,700,000,000 miles in overseas operations. It also delivered 49,778 airplanes, mostly to Allied and American units overseas, and, in 1944-1945 alone, delivered 1,480,500 tons of cargo to all parts of the world.[18]

Air Transport Command's record may be attributed to many factors. Unquestionably, General Arnold's grasp of its strategic potential and General George's direction of world-wide operations were of vital importance. Subordinate commanders, as well, deserve much credit for the command's efficient operations.

The contributions of the air transport industry were, perhaps, equally important. Executives, pilots, and operations personnel played key roles in the Air Transport Command's expanded program. C. R. Smith, president of American Airlines, was selected by General Arnold to serve as George's second in command.[19] Other men of long experience with the airlines rose to general's rank, and hundreds held

[14]La Farge, *The Eagle and the Egg*, p. 56.

[15]*American Aviation*, Vol. VI (July 15, 1942), p. 17. The organization formerly known as Air Transport Command became, on July 1, 1942, Troop Carrier Command, with responsibility for transporting tactical forces.

[16]Ferry Command's strength in aircraft at the time of its absorption by Air Transport Command is given in La Farge, *The Eagle and the Egg*, p. 53.

[17]William Roberts, "The Army Air Forces," in *The Aviation Annual, 1947*, ed. by Reginald M. Cleveland (New York and London, 1947), p. 168. These figures include the combined achievements of Ferry Command and Air Transport Command for the war period.

[18]*Ibid*, pp. 167-168.

[19]La Farge, *The Eagle and the Egg*, p. 165.

lesser positions. The North African Division, for example, acquired many of its key personnel from the domestic carriers. The chief pilot, and the men in charge of maintenance and traffic over the routes between Dakar, West Africa, and Karachi, India, were formerly with American and Eastern Air Lines.[20]

Air Transport Command also relied on private companies for specialists. In 1942 nineteen airlines formed the War Training Institute to correlate and standardize training programs for pilots, navigators, radio operators, and meteoroligists.[21] United Air Lines' bases at Denver and Oakland, California, conducted large schools for co-pilots of multi-engine transport craft, mechanics, and technicians.[22]

Civil air carriers operating under contract to the War Department transported cargo and personnel to several theaters of war. Inaugurated in 1941 by Pan American Airways, "contract service" rapidly expanded the following year when Air Transport Command did not have the crews to provide air-borne supply in the volume needed. In the first ten months of the war private companies performed the majority of overseas and domestic flights on the military air routes. Even at the close of the conflict they carried twenty per cent of the strategic cargoes.[23]

A critical shortage of transport aircraft early in the war forced Air Transport Command and Troop Carrier Command to draw upon the equipment of the domestic airlines. On May 5, 1942, President Franklin D. Roosevelt, in a memorandum to Secretary of War Henry L. Stimson and General Arnold, offered to requisition civilian airplanes as an emergency measure: "Pigs is pigs," he said, should be translated as "planes is planes."[24]

Before the close of 1942, the armed services purchased almost half of the fleet on the civil airways at the time of Pearl Harbor. Including planes released by Transcontinental and Western Airlines and Pan American Airways prior to December 7, 1941, the air transport industry lost 295 craft, including 179 DC-3's, 22 DC-2's, 17 Lockheed *Lodestars*, 19 Lockheed *Electras*, and 29 Boeing 247-D's.[25] These twin-engine airliners overcame an acute shortage of medium-range craft, but fell far short of equipment needs if Air Transport Command was to fulfill its strategic mission.

The success or failure of air-borne supply hinged on the planes which industry could produce in wartime. The prewar emphasis on training and combat types had prevented an appreciable increase in cargo-carrying planes. In 1942 production priorities were gradually raised. From a meager 271 twin-engine transports in 1941, output increased steadily to a record high of 6,792 in 1944. Simultaneously the proportion of medium and heavy transports to multi-engine bombers rose from 7.57 to a more impressive 25.74 per cent.[26]

The increase in new equipment was the result of an enormous wartime expansion in the aircraft industry. In 1941, only 161 medium transports of the Douglas DC-3 type had been built in Santa Monica, California. Three years later, new plants in Long Beach, California, and Oklahoma City turned out 4,910.[27] These famous craft, known in military dress as the C-47 or C-53, were the workhorses of Air Transport Command's routes

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[20]Eric Bramley, "North African Division —ATC Operates Like a U. S. Airline," *American Aviation*, Vol. VIII (April 1, 1945), p. 32.

[21]Howard Mingos, ed., *Aircraft Year Book for 1943* (New York, 1943), p. 180. Robert H. Wood, "OWI Report on U. S. Airlines Says 14 Fly Foreign Routes," *Aviation News*, Vol. I (December 27, 1943), pp. 7-8.

[22]*American Aviation*, Vol. VI (February 15, 1943), p. 16; (May 15, 1943), p. 45.

[23]Harold L. George in Cleveland, ed. *The Aviation Annual*, 1947, p. 152.

[24]H. H. Arnold, *Global Mission* (New York, 1949), p. 331.

[25]*Aviation News*, Vol. I (May 15, 1944), pp. 36-37.

[26]U. S. Civil Aeronautics Authority, *U. S. Military Aircraft Acceptances, 1940-1945* (Washington, n.d.), pp. 2-3, 18, 27.

[27]*Ibid.*, pp. 18, 27.

throughout the war.[28] To pilots they were "Gooney Birds" and "Dizzy Threes," remarkably reliable planes which performed well under almost all conditions.

Heavy transport planes appeared during the war in two- and four- engine models. The smaller one was the military version of the Curtiss-Wright CW-20 *Commando*, designed to provide the airlines with a faster, larger, and more economical medium-range craft to replace the Douglas DC-3. The Army Air Force took it over before a single commercial airliner could be completed.

Military production of the C-46 commenced in 1942. That year, Curtiss-Wright Corporation's plant in Buffalo, New York, constructed 46. Two years later the combined output of four factories, including new ones in St. Louis, Louisville, and New Orleans, soared to 1,321 planes.[29]

Four-engine transports were little used until 1943. The modified B-24 bombers used by Ferry Command early in the war were, at best, make-shift cargo-carriers.[30] Except for eight Boeing 307 *Stratoliners*, and less than a dozen flying boats, there were no commercial airliners of comparable size and range. In 1943, Consolidated Vultee Aircraft Corporation, formed that year to become the country's largest manufacturer, discontinued B-24 production in a portion of its giant Fort Worth plant to turn out the C-87 *Liberator Express*, a redesigned airplane which carried the bulk of overseas shipments by air that year and the next. It easily spanned the Atlantic with three tons of freight at an average speed of 191 miles per hour; loads of five tons were possible on flights of less than one thousand miles. In 1943 and 1944, the Texas plant constructed a total of 250.[31]

The best of the heavy transports, one of the finest airplanes of the war, was the Douglas *Skymaster*. Known as the C-54, it was an adaptation of the DC-4 commercial passenger liner. Its greater speed, capacity, range, and reliability overshadowed the C-87, which it readily replaced as production increased in the final three years of the war. In 1943 a single Douglas plant in Santa Monica, California, constructed 72. In the following year, a new plant at Chicago stepped up the output to 356. By the time Japan surrendered, 1,056 C-54's of six different models were in use on the military airline.[32]

American industry deserves much more credit than it has received for the triumph of air transportation in World War II. From December 1, 1941, to August 31, 1945, it provided the armed forces with slightly more than fifteen thousand medium and heavy cargo- and personnel- carrying aircraft. This was truly an astonishing record in light of the fact that prior to the war it had never produced as many as three hundred non-military twin-engine craft in a year.[33] Except for the Boeing 307 *Stratoliner*, on which construction ended in 1941, and a handful of flying boats, four-engine transports were untested on the airways

[28] *Ibid.*, pp. 18, 21. The twin-engine Douglas transport appeared during the war in several variations. The C-47 (Skytrain) was mainly a cargo-carrier, and the C-53 (Skytrooper) a personnel-carrier. Other models, numbers 48 through 52, were discontinued in January, 1943. See Richard G. Hubler, *Big Eight: A Biography of an Airplane* (New York, 1960), pp. 50-51; Leonard Bridgman, *Jane's All the World's Aircraft, 1943-1944* (New York, 1945), p. 187C.

[29] U. S. Civil Aeronautics Administration, *U. S. Military Aircraft Acceptances, 1940-1945*, pp. 21, 27.

[30] For one pilot's condemnation of the modified B-24 as a cargo plane, see Gann, *Fate is the Hunter*, pp. 213-216.

[31] U. S. Civil Aeronautics Administration, *U. S. Military Aircraft Acceptances, 1940-1945*, p. 24; La Farge, *The Eagle and the Egg*, pp. 76-77; *American Aviation*, Vol. VI (September 15, 1942), p. 3.

[32] U. S. Civil Aeronautics Administration, *U. S. Military Aircraft Acceptances, 1940-1945*, pp. 24, 27, 30; Bridgman, *Jane's All the World's Aircraft*, Vol. XXXIII, p. 164C; *American Aviation*, Vol. VIII (January 15, 1945), p. 88.

[33] U. S. Army Air Forces Commanding General, *Report to the Secretary of War, 4 January 1944* (Washington, 1944), p. 5.

on the day of the Pearl Harbor disaster.

During the war period, industry, supported by the government and the armed forces, displayed remarkable flexibility. No miracle produced airplanes. Nor were Americans more adept or experienced than their adversaries in production or business management. Manufacturers, from the largest who performed final assembly to the smallest subcontractor of parts, could and did respond to the demand for more and better airplanes because they had acquired the basic equipment and organization essential for the task. Firms which had no previous aviation manufacturing experience, aided by technicians trained in aircraft construction, converted their plants and established new ones. General Arnold pointed out that only in "America would a piano company believe that it could convert to building airplane wings in a few months, and do it."[34]

In peacetime the aircraft industry was small, but efficient. It was properly encouraged and developed, acquiring the capacity for rapid expansion in an emergency. The Air Corps, in spite of its limited budgets, "nourished" manufacturers with "experimental and sustaining" orders.[35] Similarly a policy of selecting two or more companies to build the same general type stimulated competition and individual enterprise. The B-24, developed by Consolidated Aircraft Corporation at the time Boeing Airplane Company was in production with the B-17, gave the air arm a versatile running mate for the *Flying Fortress*, and a design for bombardment, patrol, and transport.[36]

The Army Air Corps' procurement policies yielded handsome benefits to commercial aviation. The fine planes which set peacetime standards for equipment on airways throughout the world were traceable, in part, to military planning. By 1933, transport aircraft had advanced from the trimotor, the marvel of its day, to the sleek low-wing monoplane. From that date to the present airliners have retained the same basic features, including a retractable landing gear, powerful engines mounted on the leading edge of a single wing, controllable-pitch propellers, and spacious well-appointed cabin for passengers.

Boeing company pioneered and advanced the new design. The 247, constructed in 1932, was the first modern transport plane. It was a direct descendant of the twin-engine YB-9 bomber.[37] Five years later the four-engine Boeing 307 *Stratoliner*, a commercial adaptation of the B-17 and XB-15 bombers, gave the airlines greater speed, range, and capacity to exploit rising interest in America for air travel.

The Douglas company, Boeing's chief competitor in equipping the airlines, improved upon the 247 and the 307, creating the transport planes which were to serve the future military airline. The famous DC-series (Douglas Commercial) began in 1933, giving a superior airliner to the companies that had to compete with the Boeing 247. The DC-3, adopted in 1936, set the standard for many years.[38] A 21-passenger twin-engine craft, it outperformed all rivals in its class, establishing an enviable record for safety and economy. And that year, after Boeing had started work on the *Stratoliner*, Douglas also commenced development of the four-engine DC-4, production of which was delayed until the war.[39]

An overwhelming majority of the transport airplanes used during World War II were versions of peacetime models. Between December 1, 1941 and August 31, 1945, the Army Air Forces, acquired almost 14,000 twin-engine craft, about three-fourths of which were variations of

[34] *Ibid.*
[35] *Ibid.*
[36] *Ibid.*

[37] Harold Mansfield, Vison: *A Saga of the Sky* (New York, 1956), pp. 101-103.
[38] Richard G. Hubler, *Big Eight: A Biography of an Airplane*, pp. 34-45.
[39] Ibid., pp. 54-55; Howard Mingos, ed., *Aircraft Year Book for 1940* (New York, 1940), p. 237; U. S. Civil Aeronautics Administration, *U. S. Military Aircraft Acceptances, 1940-1945*, pp. 24, 27, 30.

the Douglas DC-3.[40] Designed to carry passengers on the airways, the wartime transports were not efficient cargo-carriers, but they were dependable and available.[41] Had the conflict continued beyond 1945, other planes would have been developed in quantity. The Lockheed *Constellation*, first produced in limited numbers as the C-69 in 1944, and adaptions of the B-29 and B-32 bombers with greater speed, range, and capacity, were developed instead for postwar aviation.[42]

Production reached an all-time high in 1944 when nearly a hundred thousand aircraft of all types flowed from factories to the armed forces. On December 7, 1941, after two years of the national defense program, airplane manufacturers had ranked forty-fourth among the nation's industries.[43] At that time there were fifty-nine primary assembly plants; within a year the number jumped to more than a hundred, each depending on a thousand or more suppliers of parts and subassemblies to keep production lines moving.[44] Defense Plant Corporation, a subsidiary of Reconstruction Finance Corporation, built more than five hundred facilities for turning out planes, engines, and accessories, in addition to twice that number of special projects within privately owned companies.[45] At the height of wartime expansion, the airplane industry became the country's largest in terms of employment and output.[46]

* * *

World War II air transportation was as much a triumph for industry as for the Army Air Forces and the civil airlines. Manufacturers, with ample encouragement from military planners and private carriers, provided quality equipment in quantity to meet requirements for strategic supply. Sober reflection leads to the conclusion that all three played indispensable roles in forging a new weapon. Without the contributions of each, air transportation could not have given combat units the mobility and striking power which proved decisive against the Axis.

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[40]U. S. Civil Aeronautics Administration, *U. S. Military Aircraft Acceptances, 1940-1945*, pp. 18, 21, 24, 27, 30.

[41]The inadequacy of passenger airliners as cargo transports is discussed in Charles Froesch, "Deficiencies of Converted Passenger Airplanes for Cargo Transport and Operating Requirements," Society of Automotive Engineers *Transactions*, Vol. LI (December, 1943), pp. 432-438.

[42]*American Aviation* Vol. VIII (January 15, 1945) pp. 16; (February 1, 1945), p. 43; (March 1, 1945), p. 1.

[43]G. M. Williams, "Growth of the Aircraft Industry," in *Prospects and Problems in Aviation*, Leverett S. Lyon and Lewis C. Sorrell, eds., (Chicago, 1945), pp. 3-4.

[44]U. S. Senate, Special Committee Investigating the National Defense Program, *Second Annual Report*, March 11, 1943. Sen. Report No. 10, Pt. 10, 78th Cong., 1st Sess., p. 18.

[45]Mary Pauline Perry, "521 Plane Plants Built by DPC," *Aviation News*, Vol. I (March 27, 1944), p. 10.

[46]G. M. Williams, "Growth of the Aircraft Industry," pp. 3-4; U. S. Bureau of Labor Statistics, "Wartime Development of the Aircraft Industry," *Bulletin* No. 800 (1944), p. 2.

In the European War, Allied air power was called upon to play many roles—partner with the Navy over the sea lanes; partner with the Army in ground battle; partner with both on the invasion beaches; reconnaissance photographer for all; mover of troops and critical supplies; and attacker of the enemy's vital strength far behind the battle line. (U. S. Strategic Bombing Survey)

Some Observations On Leadership

Address of LT. GENERAL IRA C. EAKER at Air University
March 17, 1961

THE SUBJECT OF LEADERSHIP has long been one of my prime interests. Upon returning from my first Sunday school, I am told, I asked my father whether I would have a chance to be one day one of the Apostles. He thought not. Subsequent events have amply verified that prediction.

In high school and college I noted that some teachers were generally recognized as outstanding, some were average or ordinary, others were lightly regarded. In those years I undertook to analyze the peculiarities, personalities, habits, and methods which made some bad, some good, and a few the best.

In 1917 shortly after enlisting, I saw my first general, Robert Lee Bullard. He rode a horse; we marched afoot. It occurred to me then that this general's job was good work if you could get it. I still hold to that view. There have been times when I was not so sure, however. When a Senator called General Marshall a traitor, and more recently when an organization distributes literature calling General Eisenhower a communist, one wonders whether the rewards equal the penalties. This I believe to be axiomatic: if any man steps out in front, if his head rises above the multitude, he can expect to be the target for the jibes of jealous lesser men.

During the years between the wars, I noted that some post and group commanders were successful, so evaluated both by their subordinates and their seniors. I studied the habits, manners, and expressions of the good and the bad to find the reasons which set them apart.

During the last war I had a rare opportunity to observe close up most of the great leaders on our side, both political and military. Even here at the top there was a noticeable variation in ability. When some spoke all listened; when others spoke there was less attention and interest. Others did not speak. I undertook in my spare time to wonder what factors set some leaders apart as superior to their fellows.

Some years ago I began the compilation of a little study entitled, "Six Famous Chiefs." They are not Indians; they are the first six Chiefs of the Army Air Corps and the Air Force—Patrick, Fechet, Foulois, Westover, Arnold, and Spaatz. I had the good fortune to work for all of them, and as a member of their staffs could observe at close range the tactics and traits they displayed, and the tools and techniques they employed. Each of them had a full bag of tricks for leadership. One favored the driver, another was best with the short irons, at least one was outstanding with the putter, but all of them were old pros from whom much could be learned about the art of leadership.

There are many volumes in the Library of Congress on leadership. I have looked them over; many of them I have read. From these and my own observations of leadership in action I want to throw on the table a few observations about leaders and their art. If some of

these ideas may stimulate some of you to further thought and discussion of this vital subject, my purpose will have been served.

The text for my sermon is an ancient fable: "A flock of sheep led by a lion will prevail over a herd of lions led by a sheep."

This naturally leads to the subject of courage as a required attribute for a leader. I suppose if you asked any ten people to name the requisites of a leader, all would have courage number one on their lists. I would agree, but perhaps for a different reason.

It is true in earlier times physical courage was the first hallmark of the leader. In the days of knighthood this was so. At Hastings King Harold was in the forefront as he was supposed to be. In the Napoleonic Wars the Emperor's Marshalls often turned the tide of battle by leading the charge. With the changing times the need for the courage to get shot at, to take the personal risks in the front ranks on the battlefield passed to commanders of lower echelons. By the time of the First World War even Division Commanders were seldom seen in combat; Army, Field, and Supreme Commanders never. Some decry this trend. The British General J. C. F. Fuller wrote a book about 1935, the main theme of which was a warning that Britain would not prevail in future wars unless her Admirals stood on the quarter-deck like Nelson, the flagship the first battle-wagon in the line, and until her soldiers were led by a man out front like Roberts and Kitchener were wont to do.

In my book courage is still the first requisite of the leader, but there are new requirements for displaying it.

The brand of courage which the top leaders were required to display in the last war was the courage of decision making. When you get right down to it, there are not many candidates for leadership, and one reason is that most men hate to make fateful decisions. When the military Commander has to make a decision which will mean success or defeat, which will cost men's lives, most men shirk from the task. The great majority are happier to follow. I am convinced that Eisenhower would have much preferred to be shot at leading a battalion into action than to have had to make many of the decisions of the Supreme Commander in the last war.

My candidate for the most courageous leader of all time will be the man who decides when he will push the button to launch the defense against the hydrogen missile or satellite war of the future. He may be deep under a mountainside, as far removed from the scene of combat as one can be. If he decides and acts in time, we shall survive. If he lacks the courage and decisiveness to move in time, we are lost. He may have less than one minute to make that decision.

Marshal Saxe said a long time ago, "Though the first quality a general should possess is courage, without which all others are of little value; the second is brains, and the third is good health."

So, let us have a look at brains or intelligence with relation to leadership. My historical and biographical studies of the great leaders of the past, and my observation of the leaders I have known, do not indicate that a high I. Q. is the certain hallmark of the leader. I do believe that all are above the average of the group they lead; all are brilliant in some areas. Some have been quite stupid in some ways. At least one leader who achieved phenomenal success for a time was quite mad. I hasten to say that his name was Hitler, lest you think I refer to some of your commanders in the last war.

Since I find so few leaders who were Ph.D.'s perhaps that is why I have been concerned of late at the current trend to turn over to scientists the selection of our weapons, and indeed the delineation of our tactics and strategy. It looks to me like this: If you want to go to the moon, call on the Ph.D.'s; if on the other hand you want to keep the peace on earth, follow men more versed in the social sciences—those who know how to influence and control the emotions and the minds of men. And here in this

connection is a thought I wish that I had originated because I think it is basic and true. It came first, I think, from General Wavel who said: "The more mechanical become the weapons with which we fight, the less mechanical must be the spirit which controls them."

A leader who can, early in his career, establish a reputation as being endowed with good luck, is fortunate indeed. Everyone wants to play on a winning team.

Napoleon's first question about a new general was, "Is he lucky?"

Sometimes principles are remembered by small incidents or homely anecdotes. One day In 1926 I accompanied our second Chief of Army Air Corps, General Fechet, to lunch. He ordered his favorite menu item, a broiled lobster. One was brought minus one claw. The General complained about this shortage in his rations. The waiter pompously said: "General, we keep our lobsters alive in a tank, sometimes they fight, now and then one loses a claw." The General replied, "Bring me a winner."

The new leader's big battle is his first battle; win that, and it is certain he'll command at the next engagement.

Historians give little space to the Fabians, the Albert Sydney Johnstons, generals skilled in leading retreats.

Rommel will be long remembered for leading the Afrika Korps to the gates of Cairo, not for the long retreat to Tunis, perhaps a more skillfully conducted maneuver.

There may be one all the world loves more than a lover; that is a winner.

I read an acknowledged authority one day who said that all great leaders of the past had one thing in common, great physical stamina, and all great leaders of the future must be sound of wind and limb. A great plea for physical fitness. By a strange coincidence the same day I read a little passage I pass on to you. "Down the streets of Portsmouth, more than a hundred years ago, walked a sailor with one arm, one eye, a persistent state of nerves, and unable to tread a ship's deck without being seasick. Indeed he would probably have been in a home for incurables, were not his name Admiral Lord Nelson. The man's spirit drove the flesh." The point is when weighing the characteristics of a leader, remember a stout spirit can drive a weak body a long way.

There is an interesting phenomenon about leadership. One does not seem to inherit its propensities or qualities. It seems to be an art that is acquired. In England I find only one example to the contrary, William Pitt, the younger. In our country there seems to be only one instance also, John Quincy Adams, where a son succeeded to his father's capacity for leadership.

I once asked a British subject about the sons of Haig, Jellicoe, and Kitchener, famed leaders of Britian's fleets and armies. One was a farmer in Kenya, another was happily tending his rose garden in the south of England. A third was a minor official seemingly content with anonymity. None seemed to have any desire or urge to follow in giant footsteps of their fathers. I suppose the outstanding example of our time would be the Churchills, father and son.

Undoubtedly one does inherit the physical and mental building blocks for leadership, but the business of forming these into outstanding qualities for leadership seem to be acquisitive, the product of individual effort, the surrounding political climate, the chance of circumstance.

There is a business of timing about leadership which intrigues the investigator. Would we ever have heard of Napoleon save for the riots in the streets of Paris? Without the controversy over slavery, Lincoln probably would have remained a country lawyer. None of the great names of the military leaders of our time would have made history's pages but for two world wars. A case can be made for the belief that great events create great leaders. Certainly critical and cataclysmic events became the stage for the great actors in history.

There is another facet of this subject which interests me. There are no reluctant leaders. A real leader must really

want the job. Washington is sometimes cited as an example to the contrary. I do not agree. Washington went to every fire which started in the Colonies from his early manhood. Nobody could have even an Indian war without George Washington. He not only was the best trained and most experienced military leader of his time, but everybody from South Carolina to Massachusetts knew it.

Churchill had been at pains to acquaint the British people of his qualities and his availability from the time of the Boer war. They did not have to look for him in England's darkest hour. He was ready and willing.

If you find need for a leader and have to coax or urge your selection to take the job, you'll be well advised to pass him over. He's not the man you need.

An interesting fact associated with leadership needs to be recognized. When the crown is placed on a head, when a general gets his stars, when a marshal is handed his baton, by a strange alchemy the recipient seems to grow in stature. There is also a corresponding change of attitude among his subjects, troops or followers. They show new respect; they accord new and often exaggerated powers to their new leader. Everyone prays and hopes he will succeed. They put new emphasis in their own effort to see that he succeeds. They want to share in his success.

Only last week I saw an excellent example. A man came into a crowded room at a reception, he was followed by an eager retinue, reporters crowded around, flash bulbs popped, autographs were sought, all wanted to grasp his hand.

Less than two years ago at a similar party this same young man stood in a corner quietly viewing the scene. He was alone, no reporters sought him out, no pictures were taken, no autographs requested. He was not then, as now, the President of the United States.

Wise leaders know how to use the symbols of the office; they recognize the great psychological impact of their flag, their crown, their stars, the physical trappings or badge of office.

It seems an anomaly that anyone should strive to be recognized as a leader as the rewards have been slim indeed. Churchill was repaid for saving Britain by being defeated at the next election. Napoleon died in exile. Lincoln was shot. Robert E. Lee came away from Appomatox and four years of crucial leadership with nothing but his horse and his sword.

Economic leadership may pay better. I suppose it does. But the rewards for political and military leadership seem to be a plot in Arlington and a paragraph in history usually written long after its subject has ceased to read.

I notice another curious circumstance connected with the leader. Running through the warp and woof of the fabric of leadership is one common thread. All successful leaders seem to have been articulate. They had a faculty for inspiring their followers with the spoken word. They could and did say the right thing at the right time. This does not mean that a leader needs to be an orator like Mark Anthony, Bryan, or Churchill. MacAuliffe was articulate at Bastogne with one word, "Nuts." Patton was often very articulate with two words, "Follow me."

The only quotation I have ever heard from Pershing was when he arrived with the vanguard of the U. S. Army in France and was called upon to speak at the tomb of Lafayette. It was a great speech. He said: "Lafayette, we are here." There are many other fine examples: "Don't give up the ship," "Fire when ready, Gridley." Lincoln's effort at Gettysburg has long since been a classic.

One of my favorite quotations in this vein comes from a message General Foch sent to General Joffre during the first battle of the Marne—"My right has been rolled up; my left has been driven back; my center has been crushed. I shall attack."

There have been great leaders who were blind, more who were deaf, but there have been none who were dumb.

All have had the wit, the timing, and the courage to influence their followers to action at the critical time by a few well chosen words or by example, or both.

The day may not be far away when we shall need urgently the greatest leader we have ever had. It is my hope that he will have the stature for the occasion. May he be well trained for his task. I pray that he have the audacity to assume the task, and the courage to make the fateful decision in time to save us. May we have the good luck to find him, and the good sense to follow him.

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Fire in the McKee Plant.

FIRST IN COMBAT

The History of the 376th Bombardment Wing

By KENN C. RUST

IN THE ENTIRE HISTORY of the Army Air Force in World War II, no operational group ever came into being in such a roundabout and dramatic way, or was born with a greater history, than the 376th Bombardment Group, Heavy. Where the normal procedure was to activate a new group with a cadre drawn from already existing groups in the United States, the 376th Group was destined not to see the 'States until two and one-half years after its creation. By that time there was no bombardment group in the AAF with a more brilliant and exciting record behind it.

Even as the forces led by Lt. Col. James H. Doolittle were attacking Tokyo and other key Japanese cities on 18 April 1942, a specially chosen task force was being prepared for further attacks against the Japanese capital. This unit was under the command of Col. Harry A. Halverson and was formed to bomb Japan from forward airfields in China. Because of

the extreme ranges which would be involved the unit, called the Halverson Detachment and code named HALPRO, was equipped with the longest-ranging, available heavy bombers—the Consolidated B-24-D Liberator.

An entirely self-contained air unit, HALPRO was assembled and receiving its final training at Fort Myers, Florida, by the middle of May 1942. Plans were carefully laid with Ferrying Command for the movement overseas, following the Southern Ferry Route to the Far East. Last minute processing was carried out at the jump-off station, Morrison Field, Florida, and the units 23 B-24-Ds were formed into two flights of eight aircraft and one of seven for the trip overseas.

Departures were at about two-day intervals and the aircraft moved south down the eastern coastline of Central and South America, then over the South Atlantic to Africa. From Africa the B-24s moved on to Khartoum in the Middle East from whence they would go on to India, and then to China.

At Khartoum, however, Col. Halverson received orders to proceed to the Delta area of Egypt and remain there for the performance of a single mission—an attack on the Ploesti oil fields of Rumania. The mission, which would be the first attack against Europe by American heavy bombers in World War II, was planned to interrupt the flow of fuel to German forces in Russia, and thereby aid the sorely pressed Russian armies.

Between 2230 and 2300 hours, 11 June, thirteen Liberators took off from Fayid, Egypt, and proceeded individually to the target. Instructed to attack at high level and then continue to an airdrome near Ramadi, Iraq, all aircraft reached Ploesti at dawn on 12 June. They found a broken overcast at 10,000 to 12,000 feet which practically obscured the targets and were forced to drop below this in order to bomb.

Ten aircraft bombed the Astra Romana Refinery at Ploesti, one attacked the port of Constanta and two bombed unidentified targets. The results were what was to be expected of so small a force—one Ploesti oil depot was destroyed and minor damage created at Constanta. Still, Ploesti had been hit. Its heavy flak opened up and fighter planes rose to intercept the bombers, but surprise had been accomplished, and the HALPRO aircraft escaped without damage. A claim for the destruction of a Messerschmitt 109 was not confirmed.

Four aircraft including that of Col. Halverson (after about 12 hours in the air and 2600 miles) made the terminus; three reached other points in Iraq, one crashing, and another sustaining slight damage in landing; two made it to Aleppo, Syria; and four were forced down and interned in neutral Turkey. Despite the accomplishment of the first AAF bombing raid against Europe, the loss of five aircraft to so small a force as HALPRO was not to be taken lightly.

Yet, before the Halverson Detachment could continue on its course, another emergency arose. The Italian fleet was spotted sailing from its great naval base at Taranto, and an immediate air strike was the only way of hitting it before it reached a valuable British convoy. Seven HALPRO Liberators, with two Liberators of No. 160 Squadron (RAF) and a squadron of Beaufort torpedo planes, were dispatched. They succeeded in locating the Italian forces south of Taranto, and the B-24s scored hits on a battleship and a cruiser. The Italian fleet was forced to withdraw. On the way back to base a single Messerschmitt 110 attacked the B-24s and was shot down by one of the gunners—the first aerial victory by the AAF in Europe.

With the completion of this second attack Col. Halverson hoped to continue on to China immediately, fearing that one more mission in the Mediterranean would deplete his unit to such an extent as to compromise its ability to carry out its primary mission. However, fate stood against him. Marshal Erwin Rommel's divisions had broken through the British defenses in Cyrenaica and now threatened Egypt. The great crisis of the Middle East was at hand, and every heavy

bomber was needed if the Allies were to stave off complete collapse in that area.

In view of these calamitous events the War Department ordered the Halverson Detachment to remain on temporary duty in the Middle East. On the nights of 21 and 24 June, when the Axis advance was most rapid, they attacked (with British Wellingtons and Liberators) the wharves and shipping at Benghazi—to deprive Rommel of supplies which would otherwise reach him in seven to ten days. From the 25th to the 29th of June they hit at Tobruk and the supply lines there, while on the night of the 28th they attacked tanks and motor transport on the road between Sollum and Matruh.

As a consequence of these attacks and Rommel's overextended supply lines the British commander, General Auchinleck, was able to gather the remnants of his troops and make a stand—at El Alamein. Meanwhile HALPRO continued to make itself felt. Convoys in the Mediterranean were hit on 4 and 9 July and other attacks were made on the ports of Tobruk and Benghazi through 15 July.

At that time plans were already in effect to withdraw the British Mediterranean fleet to the upper reaches of the Red Sea, and the base for the B-24s at Fayid was regarded as too near the front and German bomber bases for safety. The Halverson Detachment therefore flew out to re-establish itself at Lydda, Palestine. The move also brought a promotion (the unit became the Hal Bombardment Squadron) and augmentation.

Back in India on 23 June 1942, with the crisis growing desperate in the Middle East, General Lewis H. Brereton, Commanding General of the Tenth Air Force at New Delhi, received orders to take all available heavy bombers and proceed at once to the Middle East. The air echelon he took with him was named the Brereton Detachment, and was drawn from two squadrons of the 7th Bomb Group, the 9th, and 436th Squadrons. Equipped with Boeing B-17-E Flying Fortresses, a number of these men had already seen service in the Philippines, in Java, and Australia, and in Burma and India. Now they came to the Middle East to add another link in the growth of the 376th Bombardment Group.

The Brereton Detachment's advance echelon arrived at Fayid, Egypt, on 28 June and two days later was sent with its B-17s to Lydda, Palestine. In the middle of July, this detachment took squadron status, and then on 20 July was wedded with the Hal Bombardment Squadron and a group headquarters to form the First Provisional Group under the leadership of Col. Halverson. That same day the new group flew its first mission to Tobruk. It was also the 25th mission for Col. Halverson's fliers.

On the 21st the Group went to Suda Bay, Crete, and in the following days continued to hit Tobruk, Benghazi, and convoys. By 17 August 1942 when the Eighth Air Force flew its first mission against Europe, the Halverson group had flown 37 combat missions. On the majority of the oprations from Lydda, the unit staged through Fayid, where they were briefed and their aircraft topped-off before the mission.

During August 1942 the First Provisional Group was joined by the 98th Bombardment Group in the Desert War, and together, the two units comprised 80% of the heavy bomber force in the Middle East. Another change had taken place at the end of July when Col. Halverson returned to the 'States and command of the First Provisional Group was transferred (on 30 July 1942) to Lt. Col. George F. McGuire. So it was under his command the Group flew its 50th mission against a Mediterranean convoy on 2 October.

By the end of that month the final, great organizational change took place. In the early hours of 1 November 1942 the First Provisional Group became the 376th Bombardment Group, being formed largely from air echelons of what had been originally the Halverson and Brereton Detachments. Additional personnel came from elsewhere in the Middle East, and the now full-fledged 376th was put under command of Col. McGuire. It flew its first mission the same

day, against the Maleme Airdrome on Crete. Actually the mission was the 65th for the unit. No other group headquarters ever dispatched its first mission with aircraft and crews which had already completed 64 operations.

During the next two months the 376th became the only Group in Europe to operate both B-17 and B-24 heavy bombers concurrently, but all the while the B-17s were being replaced. By the end of the year the 376th was strictly a B-24 Liberator group. And another change had taken place. With the defeat of Marshal Rommel by the British in the battling around El Alamein in early November, it was possible to move the heavy bombers back to Egypt. Accordingly, the 376th left Lydda, Palestine, on 7 November and was re-established at Abu Sueir, Egypt, by 9 November. It flew its first mission from there on the 10th, going to Candia, Crete.

From the time the unit had begun operations in the Middle East it had been under control of U. S. Army Middle East Air Forces, but on 12 November that organization was superceded by the activation of the 9th Air Force, and the 376th now flew under the Ninth. At about the same time it looked as though the 376th was going to move again. It had been planned to aid the hard-pressed Russians by setting up an Anglo-American air force in Transcaucasia. For this the 376th was earmarked, but in the event, the Russian government wanted only aircraft and not crews, and the operation was stillborn.

All through these changes and potential movements the group continued operations; flying, as always, unescorted, and its targets bore full testimony to the success of the Allied cause in late 1942 and early 1943. On 15 November Tripoli was hit for the first time; on the 27th they hit Leros Island, Greece; and then on 4 December the target was Naples.

In this first mission against the Italian mainland the Group's B-24s (along with those of the 98th Group) went after the docks and the Italian fleet units in the harbor. Not only did they damage the harbor installations, but they left an Italian cruiser lying on her side. The defenses had been taken by surprise, but on the next attack on Naples, 8 December, the defenses were stronger and one B-24 was lost to flak.

Sfax, Tunisia felt the impact of the 376th on 16 December; Sousse on the 20th. On 7 January 1943 Palermo, Sicily was visited, and on the 31st it was Messina, Sicily. Naples again, on the 8th of February, was the last target hit from Abu Sueir. The 376th moved to Gambut, Libya, for three missions—Palermo, Naples, and Crotone, Italy on 20 February. That was the unit's 100th mission.

After that milestone the Group moved to Soluch, Libya on February 22-23, flying eleven missions from there against both Italian and Sicilian targets before moving on to a more permanent base at Benghazi—the Libyan port-city which had nineteen times been their target. The first mission from Benghazi was flown on 12 April to Naples. On the 28th Bari, Italy, was hit and then Reggio di Calabria on 1 May. On 28 May the Libs went to the great airdrome complex of the Italian Air Force at Foggia. Salonika, Greece was hit on 24 June, and with the coming of July a succession of Sicilian targets was hit in preparation and support for the Allied invasion of 10 July. Nine days later the 376th flew its 149th mission to another new target —Rome. After some first-rate precision bombing of the Italian capital, the Group did not operate again for thirteen days.

During this time the 376th practiced, studied, and prepared for a revisit to an old friend—Polesti, its first target. Only this time it was to take part in a daring, low-level, massed attack designed to truly cripple the vast fuel producing facilities which were Ploesti. The 376th was to lead the five groups flying on the mission, dispatching 28 Liberators under the leadership of Col. Keith K. Compton, who had been Group Commanding Officer since 20 February 1943.

Take-offs were between 0400 and 0500 hours on 1 August 1943, and after form-

View of fires in the COLUMBIA-AQUILA Refinery. Departing B-24s seen just above the horizon.

ing up over the Benghazi airfields, the groups set course for Rumania. (Flying as turret gunner in the aircraft of Major Norman C. Appold was the only non-American on the mission—F/Lt. George C. Barwell, RAF air gunnery expert assigned to the Ninth Air Force.) One aircraft of the 376th aborted, then three and one-half hours after leaving Libya the leading 376th reached a point near Corfu, an island off the coast of Greece. Col. Compton gave the signal to climb from 4,000 to 10,000 feet, and at that moment tragedy occurred. The lead aircraft of the Group, flown by 1st Lt. Brian W. Flavelle, instead of beginning its climb suddenly showed signs of wing wobble.

The B-24 made a sharp, steeply banked turn, then went into a dive to approximately 100 feet. Attempting to pull out of the dive, it went into a tight spiral and straight into the sea, exploding as it hit, and sinking immediately. Lost with the rest of the aircraft's crew was Capt. Anderson, lead navigator for the mission. If he had not been lost, what was about to happen may never have transpired.

With the lead plane gone, the deputy leader took over the formation without a hitch. Col. Compton, with Brig. General U. G. Ent (commander of the IX Bomber Command) as a passenger, remained in one of the following elements, but already the die was being cast.

At approximately 1110 hours the 376th with 26 aircraft reached the Initial Point, the small straggling town of Pitesti. Altitude was reduced to 500 feet off the ground and the aircraft roared on toward the final IP, Floresti. From it a rail line led at a fifty-degree angle from the flight path to Ploesti. However, halfway to Floresti was yet another little town, Targoviste, which also had a rail line running from it at an approximate fifty-degree angle to the southeast.

General View of Refinery during the Attack.

At the low altitude the great Liberators were now flying, Col. Compton mistook Targoviste for Floresti and erroneously concluded that the leader, in continuing the flight in an easterly direction, had overshot the IP. Accordingly, he broke radio silence and ordered the planned turn made. The 376th, immediately followed by the 93rd Group, followed out this order. The other groups, delayed by clouds over the Danube, were further behind the leaders and were not involved in the misidentification of the IP.

Lower the 376th now flew, racing on at some 200 mph. The time of arrival at the target came and went. More minutes passed, and then directly ahead, were the outskirts of Bucharest. Suddenly, the error was clear, and the sky was filling with light flak.

Col. Compton promptly turned his formation to the left, and within fourteen minutes was approaching Ploesti from its most heavily defended southern quarter. In view of the heavy defenses which were now firing, he directed a change of course, this time in an easterly direction, with the intention of giving the defenses a wide berth and reaching the IP from a less heavily defended direction.

Having flown to the east the Group then turned north and then west, completing a great half circle to come in on their assigned target, the Romana Americana refinery, from somewhere near the briefed angle. However, by the time this was accomplished other groups (the 93rd had gone directly into Ploesti from the south and the 98th and 44th were bearing down on the briefed approach from the northwest) were in the area, and the flak was more vicious than the exploding oil and gasoline.

Ahead was a wall of fire and death, and General Ent directed the 376th to attack targets of opportunity. Most of the aircraft then proceeded to attack marshalling yards and tank cars northeast of Ploesti, as well as oil wells and storage tanks. However, one element of six aircraft, led by Major Appold, flew directly into Ploesti. Flying through flame and dense smoke, they attacked the Concordia Vega refinery at altitudes from 120 to 150 feet at 1205 hours, and all six came out on the other side of the target covered with soot, but whole.

Concordia Vega had been the target of the 93rd, but they had gone after other targets after missing the correct turn with the 376th. Therefore, Major Appold's attack was the only one made on this second, most important of all the Ploesti refineries, and it secured damage. Other aircraft of the Group, in all probability, were responsible for the destruction of a train of munitions and a train of loaded tank cars in their attacks on targets of opportunity.

Only one 376th plane was lost in the target area, and another was lost after leaving the target, when it was forced by damage to fly to internment in Turkey. Twenty-three of the Group's planes returned to base, and one to another friendly field. Its loss of only three aircraft was the lightest casualty figure for any unit participating. But the important thing was that Ploesti had been reached and had been hit, dealing a considerable blow to the Axis fuel situation.

The 376th did not fly again for twelve days after Ploesti, but when it did, yet another country and another critical target was added to its already long mission list. On 13 August Weiner Neustadt, site of the Austrian plant of the Messerschmitt fighter construction complex, was attacked and hit hard. After that attack the missions continued apace. On 12 September Maritza Airdrome, Island of Rhodes, was attacked—on the 22nd it was Athens.

Between these two dates, on 13 September, the 376th was transferred to the 12th Air Force. (The 9th Air Force was disbanded in the Middle East at this time to be re-established during October in England.) On 1 October the Group moved its base to Enfidaville, Tunisia; hit Weiner Neustadt, flew six more missions from Benghazi, and then continued to blaze away at Italy and Austria from the new Tunisian base—flying its 182nd mission from there on 30 October to Genoa, Italy.

Two days later the 376th was transferred to the newly formed 15th Air Force—it had now served with three different Air Forces, a record very few other groups attained during the war. It flew five more missions from Envidaville, the last on 15 November to Eleusis Airdrome in Greece, and then moved on to be based at yet another of its previous targets.

The new base of the 376th Bomb Group was San Pancrazio, Italy, one of the many great fields in the Foggia region. There the Group came under the 47th Bombardment Wing located at Manduria, and began preparations with that Wing and the 15th Air Force for the all-out southern assault on Europe and the Balkans.

Its first mission from Italy was flown on 24 November to Sofia, Bulgaria. Klagenfurt, Austria, was hit the next day, and then on the 26th, railroad bridges on the east coast of Italy were attacked. On the 14th of December the Group flew its two-hundredth mission. The target was Tatoi Airdrome, in the Athens area of Greece. The raid was led by Col. Compton who, at the same time, completed his fiftieth mission.

On 28 December, in a raid on the Vincenza marshalling yards, Italy, the Group ran into one of the worst days in its history. Ten aircraft were lost to enemy fighters in a savage air battle, and following this raid the 376th was made nonoperational and placed on a training status. The reason was obvious. The personnel of the Group had undergone a great turnover with the transfer to Italy. There were no extra pilots, and the pilots who were in the units had, for the most part, completed all of their mission time.

New crew replacements were constantly being received, and for the next four weeks the Group concentrated on formation flying and bombing runs in a special training program set up for them.

During this period, on 9 January 1944, the Group received a new commanding officer, Lt. Col. Theodore Q. Graff, and it was under his command that they returned to combat on 4 February 1944, with an attack on Toulon, France. It was not the best time to recommence operations, as February was cold and damp, with continual overcasts threatening the success of each mission. Yet, the 376th operated, and did so effectively. In March the weather was worse, and although it often appeared "unflyable," the Group got in thirteen missions.

On 5 April 1944 the Group returned for the third time to Ploesti. It was the first attack on that target by the 15th Air Force—only the target was to be marshalling yards, not refineries, as the Army Air Force would not sanction the beginning of a campaign against German oil at that time. The briefings were clear, however, and the crews understood. In the event, the 47th Wing and the 376th Group led the entire air force, and bombing was the poorest ever turned in by the 376th as no bombs hit the MPI (the marshalling yards), and most somehow fell into the Ploesti oil refineries.

On 24 April, and again on 31 May, the Group returned to Ploesti. On 26 and 27 May they had gone to Southern France, bombing Nice and Marseilles. On 6 June it was back to Ploesti, while the forces under General Eisenhower invaded France. On 9 June it was Munich they hit, and on the 14th it was Sisak, Yugoslavia—their 275th mission.

In the morning of 16 June 1944 the Group set out with 39 B-24s to lead the 15th Air Force in an attack on the Apollo Oil Refinery at Bratislava, Czechoslovakia. As they neared the target they were engaged by waves of Messerschmitt 109s, 110s, 210s and 410s, and Ju 88s. They came in from all sides, pressing their attacks to within yards of the Liberators, some even flying through the tight formation. In one case an enemy fighter rammed a B-24, tearing off its right wing, and both aircraft went down to explode far below.

Still the 376th bore on into the flak over the target. Like an All-American blocking-back they opened the way, hit the target, and left it wide open for the following groups and wings. Just after "bombs away," another of the Group's bombers was hit by fighters and went down to explode before it hit the ground. Ten Ju 88s in echelon at 3 o'clock level, fired rockets from 1000 yards and then pressed their attack to within 300 yards. Again the 376th weathered the storm. It had accounted for three Ju 88s, as well as one 109, two 110s, five 210s and one Me 410. Behind them fires blazed throughout the refinery area, sending up clouds of smoke and flame which could be seen 70 miles away.

For this action the 376th received its third Distinguished Unit Citation. The first had been for their actions in support of Allied Forces in the Middle East Theater from May 1942 until August 1943. The second was for the Ploesti mission of 1 August 1943. Now, to these they added—Bratislava.

Then there was Ploesti again. On 23 June the smoke screen was so effective an alternate had to be attacked, but they got Ploesti again the next day with four squadrons of seven aircraft each. They had fighter escort, a rarity for the 376th up to this time, and they needed it. At the Initial Point the German fighters defending Ploesti tore into the 376th concentrating on the 515th Squadron. Flying the number two spot in this squadron was Capt. Charles L. Wimberly, and this was his first mission.

Almost at once two of the 515th's B-24s were shot down, and the attacks grew more fierce. Another Liberator fell out of formation to crash land in Yugoslavia. Then there was the flak of Ploesti, flak like no other in the whole world. You didn't walk on it, it was too thick for that. Another B-24 was hit by this flak and went down. Others were damaged, the fighters came in to finish

them. At the rally point Capt. Wimberly looked around to find he was the only one left in the squadron—and he was wounded, as were his bombardier and radio operator, and the Liberator's No. 2 engine had been knocked out. But they made it back to Italy, the sole surviving crew from the squadron. (For this mission, 135 Fifteenth heavies had hit Ploesti, and 14 aircraft were lost—six from the 515th Squadron.)

On the 9th of July they tried H2X, radar bombing aid, to hit the Ploesti refineries through the evermore effective smoke screens. They didn't do too well that time, but made up for it with the H2X attack of 15 July. On 10 August the 376th went back again and then made their 11th and last attack on Ploesti, 18 August 1944. Six days later all work stopped at Ploesti, and a few days after that the shattered remnants fell to the advancing Russian armies.

On 15 September, while the Group was flying its 332nd mission against Eleusis Airdrome, Athens, six other 376th Liberators were living up to their names. They flew to Cairo as part of Operation Freedom, where they evacuated by air the large number of 15th Air Force crewmen who had been liberated by the Russian advance through the Balkans, and then flown out to Egypt. It was one of the most heart-warming missions they ever flew, but there was still work to do.

August 30th saw the 376th, along with the 98th and 449th Groups, assigned to knock out the rail bridge at Cuprija, Yugoslavia. Carrying 2000-pound bombs with nondelay fuzes, they made spectacular hits with 95% of the bombs dropping within 1000 feet of the aiming point.

The missions continued going out to Hungary, to Yugoslavia, to Czechoslovakia, to Greece, to Italy, to Austria, to Germany, and the Brenner Pass. By 1 November the 376th had been with the 15th Air Force for one year. In that time they had flown 170 missions, lost 109 aircraft, destroyed 95 enemy aircraft, and the men of the unit had received 55 Silver Stars, 202 Distinguished Flying Crosses, 339 Purple Hearts, and 7,543 Air Medals and Clusters.

On 30 November the Group flew its 375th mission and went on adding new names to its list of places visited—Linz, Austria on 3 December; Moosbierbaum, Austria on 8 December; Salzburg, Austria on 17 December; Brod, Yugoslavia on 19 January 1945; Zagreb on 13 February; Verona on 24 February; and Regensburg was revisited on 13 March. One month later, on 12 April 1945, the Group flew its 450th mission—to Cassara, Italy, and then it flew its 451st and last mission of the war three days later against troop concentrations in the Bologna area.

In over two-and-a-half years of combat the Group had flown to targets spread across the Cradle of Western Civilization. It had attacked the enemy's industry, his bases, and his ability to resist. It had hit the enemy with everything it had but the kitchen sink. And for the 376th Bombardment Group, there could be no omission.

Everyone knew the mission of 15 April would be the Group's last, and it was agreed that every possible aircraft would go out. Over in the 515th Squadron there was a War-Weary B-24 which had been stripped of all combat equipment and then used to haul personnel and cargo. Lt. Col. Charles Wimberly, the Squadron C. O., and his staff decided to fly this aircraft on the last mission and make up for the previously realized omission. Dutifully, therefore, they loaded the War-Weary Lib with Coke bottles, beer cans, two or three broken toilet commodes and a "kitchen sink." Lt. Col. Wimberly then flew the aircraft on the mission, and from that time on it could always be said the 376th dropped everything on the Germans—including the kitchen sink.

Operations for the 376th Bombardment Group were suspended on 16 April 1945, and two days later the group was ready for embarkation. They left their areas and in thirty minutes were at the

A view of the Refinery as the Aircraft left the Target, showing several Fires burning.

docks of Taranto (another of their one-time targets) where they boarded the Army Transport "West Point." The Group proceeded back home where its men were furloughed, and then on 9 May 1945 the 376th was assigned to the 2nd Air Force along with its parent organization, the 47th Bomb Wing.

They began training for deployment to the Pacific as a B-29 unit at Grand Island Army Air Field, Nebraska, on 25 June 1945. New faces were everywhere, replacing the veterans, and then it was V-J Day. No more B-29 groups would be needed. On 10 November 1945 the 376th Bomb Group was deactivated at Grand Island.

Five and one-half years later, at Forbes Air Force Base, Topeka, Kansas, the 376th Bombardment Wing (Medium) was reactivated as part of the 2nd Air Force. To be equipped with B-29 type aircraft, the unit was taking up right where it left off back in 1945.

Training for the Wing progressed at Forbes until October 1951, when the 376th was transferred to Barksdale Air Force Base, Louisiana. There it was gradually equipped with its full compliment of B-29s and began working into shape as an Electronic Countermeasures' Wing. Although the unit did not get into combat in Korea, it did send some personnel on TDY status to the 307th Bomb Wing on Okinawa. Training missions continued, proficiency increased, and then in January 1954 the Wing began re-equipping with Boeing B-47 Stratojets.

On 1 December 1957 the 376th was transferred to its present operating station at Lockbourne Air Force Base, Ohio. Since that time it has been heavily engaged in providing electronic countermeasures operations to support higher headquarters directed missions. Its aircraft were the primary test beds for the development and testing of electronic warfare tactics and equipment utilized by the Strategic Air Command.

The Wing was repeatedly called upon during 1958-1960 by the Weapons Systems Evaluation Group, an agency of the Joint Chiefs of Staff, to evaluate certain weapons systems of the Army, Navy, and Air Force. As the primary unit flying for the Agency the 376th successfully completed 492 out of 493 sorties, before termination of the tests.

At present the Wing is operating in conjunction with Air Defense Command and continuing to pile up an evermore impressive record. During the calendar year 1960, the 376th flew over 4,200 sorties and 26,000 hours without a single aircraft accident of any type, and with only 70 late take-offs, and 51 maintenance cancellations. Since 1 April 1959 the Wing has been under the command of Col. Charles L. Wimberly, the same man who flew with and commanded

the 515th Squadron during World War II.

The 376th has come a long way since that day in June 1942 when, as the Halverson Detachment, it first attacked Ploesti. Members, past and present, can be duly proud of the singular and outstanding operational history of this great fighting unit. May their past tailor their future, if they should ever again be committed to active combat.

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HINDSIGHT

Prior to the Europen war, we underestimated the predominant role that air power was to play and allocated to it too small a share of even the inadequate resources then available to the Army and Navy. At the outbreak of the Pacific war, our deficiency was particularly great in modern land-based fighters and in carriers. One thousand planes in the Philippines, at least equal in performance to the best then available to the Japanese, including types effective against shipping, well-manned, equipped and supplied, and dispersed on some 50 airfields, would have seriously impeded the original Japanese advance if knowledge of their existence had not entirely dissuaded the Japanese from making the attempt. The loss of relatively antiquated battleships at Pearl Harbor had little effect on the Navy's combat capabilities at that time, while the addition of a few carriers would have enormously increased its capabilities. (U. S. Strategic Bombing Survey)

Red Tape and a Flying Swede

Why Erik Nelson Left the Army

By RICHARD CARROLL
(First carried in *Liberty* Magazine, January 19, 1929)

IT CAME AS A SHOCK when I read that Lieutenant Erik Henning Nelson, one of the six round-the-world fliers, had quit the army. Four of the others had preceded him. Arnold, Harding, Wade, and Ogden were out. Only Lowell Smith remained of the daring aces who made that historic flight. Now Nelson was quitting, and the strangest part of it was that Nelson was passionately fond of the service, rated among the best by his fellow aviators, and personally popular with all.

It was obvious that something was wrong with the system that took from military aviation the best men it could produce. Dozens of others had preceded Nelson. Others would follow.

Nelson's own explanation gave hint that something more than a better job elsewhere forced him out. True enough, the army pay, even for a flight lieutenant, was meager, little more than $100 a week. But the real flying aces have never fussed over money. The actual trouble seemed to be that at the age of forty, with a remarkable record of achievement behind him, unlimited experience for future guidance and training for leadership, there was not the remotest possibility that his proven ability would be given a chance to show itself. Other and lesser men were, and always would be, ahead of him for promotion.

I wanted a talk with Nelson. For days I tried to reach him. Now he was in Washington; next back in New York. I trailed him to Buffalo. Then he jumped to Seattle, Washington, where, at the offices of the Boeing Airplane Company, I found him. He was the new sales and promotion director. The company, located just outside Seattle, boasts the largest airplane factory in the country. Erik was already a valued member.

So much did his new bosses prize him, I again wondered at the army that had so easily parted with him.

Nelson, too busy during the day to talk at any length, submitted during the evenings to being pried loose from some valuable information. His was a remarkable story. The personal side, his earlier struggles and ambitions, his hard life leading up to his first flying venture, showed well how that iron character had been molded.

Born in the city of Stockholm, Sweden, on the 12th of June 1888, almost his first act was a gesture toward the sea and the life of a sailor. At the age of three his mother found him astride a chair in the kitchen, a napkin unfurled for a sail, and a ladle handle for a tiller. He was playing sailor.

At sixteen he had accomplished his infancy's wish. He was a sailor before the mast, bound for England, the West Indies, various ports of the New and Old Worlds, on the three-master Atlantic.

Erik had all the qualifications of a good seaman. He had strength, willingness, and skill. Early life in Stockholm had seen him rated a good swimmer in a

LT. ERIK H. NELSON

city where every youth could swim. He was fond of athletics and excelled in them, but swimming was his hobby. He was always in the water, diving, swimming long distances, performing stunts of all kinds.

The boy then had no definite ambition that took him beyond the deck of a sailing ship. Enough for him that the strange, undefined yearning in his soul that sent him into new lands to see faces he had not seen before, to harden under foreign suns, to feel the glamour of alien places, had found outlet.

For the young Erik possessed that indefinable something that drove Erik the Red across uncharted seas of a younger world; that pushed Leif Ericsson into strange perils, that in a later day sent Amundsen to the pole, Lindbergh soaring across the Atlantic, a hundred adventurers off the beaten track and into the wilderness of fame.

The Scandinavians have ever been glamorous in their deeds. Nelson was of them. They have been the explorers, the continent finders of the world. The Danes, the Swedes, the Norwegians, bred in the stern cold of their homelands, could laugh at hardship elsewhere.

And this was the type of man who had to leave the army of the United States because promotion was to be denied him for ten years to come while commissioned clerks rose above him. One could picture Erik Nelson when, at twenty-one, he landed in America, definitely decided to quit the sea, to strike out for himself in this new land.

Standing more than six feet, with keen eyes that had the blue clearness of the sea in them, square of shoulder, slim of hip, he presented a replica of the fair-haired vikings of an earlier age.

But if some prophet had told this Swedish sailor then that on a future day he would supply for the patriotic historians of this foreign and greater nation a new proof of their country's heralded opportunities, he would have laughed at the absurdity. If the visionary had gone further to predict that a future act of this sailor would help change the plans of a nation's defense, would as an act of protest call attention to a national military weakness, he would have seemed insane.

Yet Nelson did all that.

For the common sailor who was then Erik Nilsson was to become First Lieutenant Erik Nelson, U.S.A., and, in nine short years after an immigrant landing, take his place among six of the country's best aviators to carry his country's flag first around the world.

Sitting in a prosaic room in a Seattle hotel, Nelson's story sounded simple enough in the telling. But the nervous energy of the narrator told another story. He could not sit still. No chair was comfortable enough. Now he was perched on the table, now on the edge of a chair. Again he would sprawl on the bed, only to get up each time and pace the room. The man was energy itself.

Yet he told no story of impossible odds overcome in daring fashion. No struggles against fate with wit the only weapon. As his viking fathers sailed blindly down

to sea before him, to carelessly chart new worlds and new oceans, so Erik did, to take what life held for him, all of it.

Danger came to him many times in many forms. Once, on board the Dowan Hill, a three-master sailing out of London for Port Adelaide, Australia, he had a narrow squeak. The ship was plowing her troubled way through the Southeast Straits, making about seven knots in a stiff breeze. Her crew were a rough-and-tumble bunch gathered from all corners of the globe, the dirty corners. Over them was the mate, a domineering, brutal, Liverpool bucko. The men despised, feared, hated, and obeyed him.

Erik, then a youngster bordering twenty, was aft when the cry "Man overboard!" reached him. Without hesitation, he plunged over the stern. The man had gone over forward. Erik reached him as the ship swept on her course. Excited sailors threw a line and missed. The ship sailed on. One sailor dropped a life preserver. Erik grasped it and the drowning man at the same time. The man struggled frantically, he could not swim. The ship was bearing away.

Erik looked at the man. It was the mate. For forty minutes Erik kept himself afloat, the mate bobbing up and down beside him. The mate gurgled and died. Erik swam beside the body. The ship returned and the men hauled the exhausted Erik aboard. That night, to the accompaniment of ribald songs, the mate was buried.

Erik later was awarded the Royal Humane Society medal for bravery—which medal he neglected to take because, when the officials at Newcastle, New South Wales, had gathered for the presentation, he discovered he had a date with a girl and ducked away to keep it.

Erik Nelson stayed before the mast until he was twenty-one years old. On the 15th of April 1909, he landed at Hoboken, New Jersey. He had few friends, a small amount of money, and no particular place to go. Eventually he landed a job in a shipyard at Greenwich, Connecticut. For eighteen dollars a week he rigged yachts, scraped, and painted them.

Vernon C. Brown, a broker, liked the thorough way the new man handled his job, and hired him for his own yacht, the Iris. Erik passed his spare time swimming in Long Island Sound, where he would remain hours in the water, day or night.

In the fall of that year he found himself again without work. Fleischman Baths needed a man as rubber. Erik applied for, and landed the job. Among the patrons was Oscar Hammerstein, then producing the opera "Herodias." Erik's magnificent build appealed to him and the ex-sailor became a soldier, a Roman soldier of the stage, wearing a black wig to hide his blondness.

When the opera closed Erik went back to his boats, and for five years thereafter drifted from job to job, but not without picking up information that was to be of supreme value to him later. Always of a mechanical turn of mind, engines began to fascinate him. His father had been an engineer and the gift of engines had passed on to the son.

The year 1913 found him in Florida operating a garage which, with a partner, he had started on a capital of thirty-five dollars. The garage business was beginning to prosper when an aviator, Victor Vernon, flew into town. As frequently happened in those days, something went wrong with the engine of the plane, a Curtiss flying boat, equipped with an OX motor. Vernon called on Erik to help him.

This emergency call proved to be the turning point in Nelson's life. From the day he first worked over the engine of the plane and got a ride in the air for reward, Erik's thoughts turned skyward.

The garage business went hang. Erik camped beside his new-found toy, slept on the beach near it at night when repairs were done, and flew with its pilot during the day. From that time on he had no thought other than to learn to fly.

When Vernon flew back to New York, Erik found himself with nothing to do. He wanted to fly, but there were no

meals in the sky. He had to eat. For several months he worked at odd jobs, finally signing as captain to take an eighty-five-foot yacht up the Hudson to Lake Champlain.

It was Erik's last trip as far as surface boats were concerned. He could not now be content unless fooling around airplanes. He drifted in and out of various flying fields at Buffalo, Langley, Newport, doing odd jobs and all the while picking up scraps of information. Pressed for money in 1916, he volunteered to take the singer, Riccardo Martin, across country in the latter's Lancia. This trip put him in funds for a while, and gave him enough over to land at Newport News flying school, where his work consisted mostly in pushing planes in and out of hangars.

Two youngsters, Andrew Jackson and Donald Douglas, drifted in with a flying boat they were going to use as an instruction ship. This would have been all right if the youngsters had known how to fly. They didn't! Erik went to Florida with them, glad to be near a plane offering a chance for flight.

The first time in the air with Douglas and Jackson at the controls, the ship went into a spin and crashed in the waters of Indian River. The plane landed upside down. Erik, on shore at the moment, went to the rescue in a speedboat. Arriving at the scene, he found Douglas atop the wreckage.

Jackson was underneath, strapped to his seat. Erik dived for him, fought the straps that held him, and brought him to the surface. It was the feat of a great swimmer. The youngster was badly injured and almost drowned. Erik revived him. He recovered. Erik went back to Buffalo and never saw the boys again.

The following year, 1917, witnessed America's preparation for entry into the war. Nelson immediately applied for a flying course with the Aviation Corps of the Signal Service. He was rejected. The man who was later to be ranked among the world's greatest fliers wasn't wanted because he was not a college graduate.

Erik went to Canada, and was rejected there. Now he was too old, twenty-nine. The age limit was twenty-five. In despair he returned to America and registered for the draft, willing to go in any capacity. Waiting to be called, he joined a flying school as general handy man.

Here he met several influential men who were later to help him on his chosen way. Malcolm Stevenson, the international polo player, was learning to fly. F. Trubee Davison, now Assistant Secretary of War for Aeronautics, was another pupil. They met, and liked the young Swede, whose whole ambition seemed wrapped around an airplane.

Whether they had anything to do with it or not, that fall found Erik in the army, a cadet in the flying service. He was sent to ground school at Cornell University, and from there was transferred to Ellington Field, Houston, Texas.

And now, the knowledge of airplanes so painstakingly gained in the preceding years, proved a hindrance to further ambitions. With J. J. Kelly, the veteran pilot, he was the only man at the field who could line up a plane, rig it, and put it in condition to take the air. Naturally, the officers in command would not let him go. His entire class was graduated, and still they held him. Seldom complaining, he was driven to complaint, and the only result was that he was put on as a regular instructor in advanced work.

All efforts to get overseas with his own gang from Cornell proved unavailing. He was too valuable an instructor. The wind-up of the war found him still drilling recruits.

But the finish of the war was the beginning of his rise. There were now no recruits to train, or, if there were, there was no hurry about it. Such a flier as Nelson had become could be used to advantage by the army. Long-distance flights were then a rarity. The army flying officials saw the value of favorable publicity.

In January 1919 the first real cross-country flight was planned. Nelson, with three other planes, set out from Ellington Field for San Diego. The planes flew direct to their objective, turned at

San Diego and headed up the coast for San Francisco, over unmapped route to Reno, to Glenwood Springs, hopped the Rocky Mountains to Denver, then to Omaha and back home. The entire trip, made in De Havillands, was without accident of any kind from start to finish. It was the most successful flight of its kind made up to that time.

Much of the credit can be safely bestowed on Nelson, who, in that flight displayed the genius for mechanical detail that was later to distinguish him on the flight around the world. The man actually loved engines. Every night found him tuning and repairing, working over them with diligent care.

Later flights became a matter of public record. In 1920 the flight to Nome, Alaska, and return, became a mark for aviators to shoot at. Again the difficult trip was made without so much as a forced landing. Nelson's position was assured in the select world of aviators. His last flight alone was enough to rank with the aces.

At Detroit in 1922, Nelson brought a twin-motor plane across the finish line to take first in his class. In the following year he engineered the six-plane flight from San Antonio to Porto Rico and back to Washington, D. C., making it in thirty days.

Then came the world flight. That story has been well-written into the annals of American achievement. It stands out now, over a distance of five years, as one of the most glorious adventures in the history of man. Twenty-six thousand miles flown in 175 days. The names of Smith, Arnold, Nelson, Harding, Wade, and Ogden, take their place in the history of great adventurers.

Sailor, soldier, mechanic, swimmer, all-round athlete, there was no emergency to which Nelson could not rise. Broken pontoons on the planes needed good swimmers who could reach them for repairs. Engines had to be nursed, courses had to be charted. Nelson fitted the bill.

There can be no question that his early training lifted him above all others for such a flight.

He was a good soldier, too, who knew how to obey orders. That alone, with his knowledge, marked him as fit. In the one misunderstanding that occurred on an otherwise perfectly planned flight, Nelson's part was that of the rigidly disciplined subordinate. He followed orders literally, and at once. That some hesitant criticism should be leveled at him at first, was to be expected.

When, in an early stage of the flight, one of the planes separated from the others, the order was given that in future jumps all should stick together. This, of course, was necessary if the flight was to succeed.

In the long, dangerous hop from Kirkwall, Scotland, to Hornafjord, Iceland, the three planes started out together. Smith and Arnold, flying the flagship "Chicago," took the lead in the air. Nelson and Harding followed in the "New Orleans." Wade and Ogden came last in the "Boston." When nearly 115 miles off the Orkney Islands, Wade was forced down. The ships became separated in the fog. Nelson circled over the crippled "Boston," saw that he could do nothing, and headed onward for his goal. The "Chicago" was not in sight.

Then it was that Nelson had to make his own decision. Should he turn back to make sure Commander Smith was on his way? Should he continue through the blinding fog to Iceland? His orders had been to fly to Iceland. Being the soldier he was, he did not hesitate long. The nose of the lone ship swung out to sea.

Help was coming to the Boston. Smith, fearing he could not get through that almost impassable barrier of fog, turned back. Nelson did not know that. He flew on. Alone, he made it. When the New Orleans dropped to rest in the harbor of Hornafjord, Nelson had achieved the impossible. He was cheered above his comrades.

The criticism leveled at him for leaving his comrades came from those ignorant of the circumstances. Instead of blame, Nelson deserved all praise—for

his seamanship, his superb piloting, and his willingness to obey his commander's orders at any cost. Smith had ordered the planes to Iceland. Nelson, through fog, wind, and rain, flew there. It was the only decision he knew how to make.

Now this ace of fliers is lost to the Army Air Service. Why? Because any officer, be he ever so ignorant of aeronautics, can step into a rank over Nelson's head and tell him, who helped fly the army into fame, how flying should be done. Ten years from now he might rise to a captaincy, if enough men ahead of him died or retired. But the system lifts men from the infantry, the artillery, the cavalry, from all branches of the service other than aviation, and makes of them officers superior to those who have spent their lives to the furtherance of aeronautics.

Nelson's resignation was not a step toward personal betterment. It was a protest against the system, a plea for a change in army procedure that would give the men of his own profession some of the recognition their work demanded.

Nelson knows, as every flier knows, that the service to which they are devoted will not come into its own until it is divorced from the ponderous, choking weight of army red tape. Aviation must be taken entirely from the army. Mitchell preached it. Every flier believes it. Navy and army alike have nothing in common with aeronautics. The ponderous bulks that crawl along the surface should not, cannot, pinion the eagle that soars into the sun. Aviation is for youth. Generals and admirals are old.

When promotion becomes possible within the ranks of the Air Service, the best men will remain. The Nelsons and the Wades, the Ogdens, Arnolds, and Hardings will find scope for their talents, advancement for their ability, and will not, as now, meet hindrance from their superiors.

"The German economy is heading for inevitable collapse within 4 - 8 weeks."

Report of Speer to Hitler
March 15, 1945.

Militarism or Antimilitarism

The Real Threat To American Security

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DR. ALFRED VAGTS, one of our foremost military historians, in 1959 reissued his *A History of Militarism*, originally published in 1937.* This is not a simple reprint but a partial rewrite in which the author covers events which occurred during the last twenty years. Still, since documentation on recent developments is as yet poor, the book remains in the nature of a treatise on mass armies and World War I. It nevertheless deserves our full attention because militarism is a phenomenon of great and lasting importance; and because the analysis of historical precedents (and a truly impressive number of those is presented in this work) should enable us to identify and handle our current pressing problems more effectively. Consequently, Dr. Vagts' book should be read, with care and concentration, by all those who are concerned about the security of our country.

The subject of militarism definitely has not found the attention it deserves. But the question is: what are the types of military politics the U. S. can live with, and what are those types which may spell disaster?

The author makes a fundamental and fateful distinction between the terms "military" and "militaristic."

> "The military way is marked by a primary concentration of men and materials on winning specific objectives of power with the utmost efficiency; that is, with the least expenditure of blood and treasure. It is limited in scope, confined to one function, and scientific in its essential qualities. Militarism, on the other hand, presents a vast array of customs, interests, prestige, and thought associated with armies and wars, and yet transcending true military purposes. Indeed, militarism is so constituted that it may hamper and defeat the purposes of the military way. Its influence is unlimited in scope. It may permeate all society and become dominant over all industry and arts. Rejecting the scientific character of the military way, militarism displays the qualities of caste and cult, authority and belief."

It follows from this definition that if we are to understand strategy and plan properly for our defense in order to win our conflicts with the least risk and most effectiveness or, for that matter, be able to deter major wars, militarism must be controlled. Hence we must ask whether there is a particular form of militarism which is typical of the United States and which is endangering the specific security of the American nation?

European militarism, particularly the militarism of Germany and France, was characterized by what could be called political meddling. Military rank often served as a springboard to political power, and in many instances the militarists imposed their will upon political authority. We know, for example, that in 1914, the German generals deliberately misled the government to bring about war against France which, quite stupidly,

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**A History of Militarism, Civilian and Military*, revised edition, Greenwich Editions published by Meridian Books, 1959, 542 pages, with illustrations, footnotes, bibliography, and index, $7.50.

they considered necessary, although the German strategic objectives were in the East, and although it might have been possible to fight a "limited war" against Russia: Russia and not France was Germany's "natural enemy" at that time. In the person of General Ludendorff German militarism imposed war aims on the government which were entirely impractical, prevented the conclusion of a peace of compromise at a moment when victory no longer was possible, and led the country into ruin. German pre-1914 *navalism,* which is a very important partner of militarism, was perhaps the most important cause of the basically unnecessary conflict between Britain and Germany: German strategy simply did not require a strong navy. Conversely, if German strategy had aimed at the destruction of the British Empire, the admirals failed to build a navy which could have been used for that purpose.

In France, the general staff was a power onto itself for many years, and successfully kept civilian ministers out of its secrets. In the Dreyfus case it produced an entirely superfluous domestic crisis which all but broke the republic. Of course, France is the origin of the "man on horseback" and of the Napoleonic model of the soldier-statesman.

In the United States more generals acceded to the presidency than in any other democratic republic (if we disregard Latin-America), but it hardly can be said that this was an important manifestation of American militarism or of militarism in general.

An important distinction could be made between militarism turned outward from the military establishment and militarism which affects the military forces directly. Among the manifestations of militarism turned outward we find the imposition of military caste considerations upon policy, the tendency to militarize civilian institutions without necessity, and the acerbation of international and sometimes domestic conflicts as well as the exploitation of crises for the seizure of political power. These forms of militarism have had little impact on American history.

In former times, militarists extolled the martial virtues and the glories of war, but in recent times this particular aspect of militarism has been found more frequently among civilians who, like Mussolini and Hitler, adore war for war's sake. Sinovyev, Lenin's lieutenant, called for "our own socialist militarism." Even that great civilian, Franklin Roosevelt, once asked the Secretary of State to address him as "Commander-in-Chief, not as President." In this century, it was mostly civilian leaders who insisted that wars must be fought to the point of "unconditional surrender" and the complete emasculation of the enemy. Thus they prolonged wars needlessly, often against the more pacifistic advice of the soldiers.

Militarism turned inward has manifested itself in the mismanagemert of the armed forces, overemphasis on drill and discipline, traditionalist thinking, irrational decision-making, resistance to technological change, the subordination of security interests to the advancement of individual careers, poor utilization of professional staffs as well as of reserve forces, inter-service and personal rivalry, and in fighting between commanding officers, sometimes to the point of plotting the battlefield failure of a hated competitor. Those forms of militarism, indeed, have had an important place in American military history.

For example, American military forces often have been sent into battle with weapons vastly inferior to the arms in the hands of soldiers from technologically backward countries. United States history is replete with examples of "wars" fought privately by one commander or one service, e.g., separate undertakings by the Marines. It has been customarily most difficult in the American military establishment to make rational decisions about weapon systems and effective command and organizational arrangements. It also has been traditional for one service to try to hamper the other services in their development.

Perhaps the war in the Pacific offers some of the worst examples of American militarism. Not only were the American forces quite incapable of defeating the significantly weaker Japanese in 1941, or of throwing them back with dispatch, but toward the end of the war Japan, which had only one-tenth of the American war potential, was subjected to half a dozen or so strategic attacks, every single one of which could have been decisive. Never owed the world so little to so much military power. No more wasteful strategy ever was seen in the annals of war.

Of course, examples of unnecessarily bloody battles are not missing, and again the Pacific war provides numerous unedifying examples. Silly assertions like the denial that naval ships can be sunk by aerial attack or that one can *stand* at one end of Washington airport if an atomic bomb explodes at the other; refusal to buy from the Wright brothers their early aircraft because it could not take off from a ploughed field; artificial limitations imposed on the range of bombers; the neglect of the submarine in favor of glamor ships which have little military worth; concepts of *strategic* airborne operations, as well as premature and exaggergated claims for airpower when flying was in its infancy but subsequent readiness to concede nonexisting limitations of airpower; — all those are manifestations of militarism which have hurt this country.

Yet those are only the most blatant examples, and every American soldier can add to the list, and even include cases which go beyond the bounds of decency. If the United States military establishment had not been backed up by an extraordinarily resourceful industry and by enormous logistical capabilities, its history might well have been filled with disasters and defeats. As it was, for the last hundred years or so, American military "art" was based largely on the procurement and utilization of overwhelming brute strength; its successes, more often than not, were in the class of the "victories" which a six-hundred-pound wrestler usually wins over a two-hundred-pound opponent. In brief, there was production and transport, but little proficiency in strategy and tactics.

American militarism also manifested itself in the frequent underrating of the military and technological capabilities of enemy countries. This overconfidence derives in large part from the uncritical and naively chauvinistic nature of American historiography, but other ingredients of this dangerous mental attitude include the deliberate manipulation of intelligence data, misleading and sometimes downright mendacious service propaganda about weapon systems, distorted presentations to Congress, e.g., the warping of the findings of the United States Strategic Bombing Survey during the 1949 controversy about the B-36.

On the other side of the ledger, the American military establishment often acted contrary to what could have been expected from a "militaristic" force, without necessarily improving the effectiveness of the "military way." For example: it did not exploit the threat of Nazi Germany to request the build-up of American forces to the level demanded by the emergency. When in 1940, the military were asked to get ready to defend this country against an opponent who clearly had been underrated, they were unable to see "big enough," and the plans for the expansion of American power had to be formulated by civilian authority. In more recent times, military leaders, time and again, have bent over backwards to conform to the dictates of civilian authority, often against their better conscience and sometimes perhaps against the obligations they assumed in their oath of office.

Yet here is still another side to this picture. The military, partly under civilian impulsion, but to large extent on their own volition, have moved against some types of militarism. For example: the traditional reproach that the military are opposed to technological innovation, no longer is valid. In fact, technology now receives its main support from the

military establishment to a point where the services have moved into the advanced guard of inventors, and have become the chief employers of the most forward-looking technologists, and where private corporations, in disregard of their assigned function in life, rely on military initiative. The list of inventions which were made for military purposes and under military contract, and which have become immensely important to civilian life, such as electronics and high temperature metallurgy, is growing all the time. In a recent study of current military R & D projects, 400 pages were needed to describe those which have "civilian applicability."

The program of nuclear weapons—initiated, to be sure, by outside civilians and pushed through against the opposition of inside civilians—has provided civilian society with its greatest source of potential energy. It should have been expected that the civilians would take over with alacrity, nuclear power for civilian utilization. Yet nothing of the sort happened, and the program for nuclear electric power had to be initiated from the Pentagon. The military pioneered into space—a fact which will have great significance for civilian life. If everything is said and done, but for the military impact, there would not be a workable automobile, a television industry, or even airmail services.

Today, the interest of the military in the development of new technology no longer is being circumscribed by militarism, although some conservatism remains and sometimes even may be useful against "long-hair" ideas. Essentially, technological development is held back by civilian decision-makers either directly, or indirectly, through budgets. For example: early preoccupation with long-range missiles was stopped by civilians, both of the scientific and executive species, although it is true that, albeit for financial reasons, the Air Force subsequently "dragged its feet" before it put the missile program on the road again. The nuclear submarine had to be forced upon the admirals by an alliance of naval dissenters and outside civilians. Thus, the picture may not be entirely clear-cut. Yet the fact remains that the rate of military innovation is not any lower, but probably higher, than the rate of civilian innovation which, for that matter, depends largely upon military stimulation. Unfortunately, however, the American rate of innovation probably is lower than of some other countries and may not meet the requirements of our own strategy. The military have been unable so far to "sell" the civilian society on the fact that the U. S. is engaged militarily in a technological race, and that if we are to survive, we must win it. Perhaps the *weakness* but not the lack of the military commitment to technology is the present danger. But according to all appearances, the times of Field Marshal Suvorov who considered the bullet to be a traitor and relied only on the bayonet, are over. Certainly, the military understand the urgency of the technological challenge better than the civilians.

There is still a fourth aspect to consider. There are indications that the reaction against "militarism" may have gone too far. For example: it is very dubious whether the various "modifications" in disciplinary practice, which softened standards of military discipline, really were justified or contributed to the "democratization" of the armed forces. Some of these "reforms" undoubtedly have undermined combat efficiency. The lowering of physical fitness and of courage under fire are due, in part at least, to the softening of drill and training and to a de-emphasis of what might be called the military virtues. The spectacle of the Korean prison camps which necessitated the promulgation of a new code of military behavior surely is an indicator that the mentalities produced by the armed forces leave much to be desired. Without hardening of morale and without a willingness to fight, suffer and die, battles cannot be won. General S. L. A. Marshall's findings that only a small number of American soldiers ever fires a gun in earnest and that an even

lesser number takes careful aim to kill an enemy, is another example of the same kind. The military commitment to "science" is very commendable, but fighting still remains the primary job of a military force.

In the area of decision-making, the military have abdicated many of their functions to scientists and civilian committees. In an age of scientific warfare the scientist obviously is irreplaceable, and there is no question that in many instances scientists have made very excellent recommendations. Nor is there any question that understanding of scientific problems has become mandatory for military staffs and for commanding officers, if military decision-making is to be effective.

Nevertheless, science is only one aspect of the overall military problem. If it is allowed to predominate, military failure will be as inevitable as it would be if science were disregarded. As it stands now, decisions about such matters as deployments, manning tables, even tactics, are customarily influenced heavily by civilians, mostly of the scientific politician type; sometimes these people even make or impose decision. What is worse, many of those scientists are neither good experts nor particularly experienced in the areas in which they make recommendations. Those men are drawn into the military establishment because of political constellations or for other extraneous reasons. Although they may be knowledgeable in one particular area, they do not comprehend the overall problems, and they never acquire this comprehension because they remain with the military for a short while only, till a better job comes along. Committees usually compromise members who knew nothing about the military problem which was thrown their way, but within four to eight weeks taken from the onerous labors of university teaching or laboratory work, they are ready to hand down verdicts about the most difficult questions of our time.

There are even worse cases: some scientists, after having disastrously influenced military decisions, believe and convince presidents and secretaries of defense that they are really knowledgeable. As a result, they are placed on one committee after the other and, of course, contribute to one wrong decision after the other. One famed scientist-politician who delayed the American missile program—the ICBM was too futuristic for him—wrote a book in which he predicted that the Soviets would not have an atomic bomb in many years to come. The passage was in galley proofs when the first Soviet A-bomb was exploded. This same man considered himself such a genius that he made all kinds of predictions about the scientific capabilities of the Soviet Union. He knew nothing about that country, even less about communism and Soviet scientific institutions and practices, but he operated on the assumption that his knowledge in some scientific fields made him an expert in all spheres. Scientists also have made strong efforts to impose their views on such matters as national strategy and disarmament, although they do not understand the practical problems involved, and often have been in politics for so long that they no longer are up-to-date in their sciences. In some of this agitation scientists have departed from the basic code of scientific behavior inasmuch as they disregard or "reinterpret" evidence to buttress their preconceived arguments. The military are so cowed by scientific reputations that they defend themselves only weakly against such encroachments. They are so afraid of criticism on the grounds of "censorship," that they never dare getting rid of harmful but vocal scientific influences.

Insofar as relations between the military and the budget economists are concerned, the situation is just about as bad. It is quite true that there must be, somewhere, a limit to military spending. It is also true that the Bureau of the Budget has a responsibility toward the nation. Constitutionally, the purse strings are vested in Congress; in actuality, spending has become an executive prerogative. Perhaps this was inevitable in an age of

complexity, but whether it is the right solution to allow budget officers to make military decisions, is an entirely different question. Few people would think so and even fewer would grant such life-and-death powers to junior budgeteers, but this is what happens every day. While the scientists tend to be familiar with some military problems, budget officers usually are not, and few efforts have been made to render budget officers more knowledgeable in military affairs which, of course, could be done, although it would require more than occasional attendance of a budget officer at the National War College. Of course, we are entirely in Wonderland when, in order to humor the Bureau of the Budget, intelligence estimates are "rendered more realistic," i.e., if threats are minimized, or when budget officers place evaluations on the validity of military information and secure acceptance of *their* estimates at the executive level.

A sample of this technique was displayed when, on July 12, 1959, the Associated Press carried the following illustrative story:

> "Sen. John Stennis (D. Miss.) says there is serious doubt that an incoming enemy atomic bomb will be destroyed even if the airplane carrying it is hit directly by the nuclear warhead of a United States missile.
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> That is why, Stennis said in an interview, the Senate Armed Services and Appropriations Committee have cut back sharply the programs for the rival Army and Air Force defensive missiles. . . . Stennis' comments came after closed-door testimony given by Maurice H. Stans, director of the Budget Bureau, before the watchdog Senate Defense Preparedness Subcommittee and released after screening for military secrets. . . . With Soviet Russia shifting emphasis from manned bombers to missiles, Stans testified that the budget experts questioned the billions of dollars planned for the Army's Nike Hercules and Air Force's Bomarc missiles. . . . Stans was asked directly 'could the warhead on the Bomarc or the Hercules destroy the bomb carried by the manned bomber if it hit the bombers?'
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> 'I don't know that there ever has been a final answer on it,' Stans replied. 'Again I think it is a matter the scientists would have to answer for you.'
>
> Senators said that Secretary of Defense Neil H. McElroy and other Pentagon spokesmen had testified that a nuclear warhead of a U. S. missile would destroy the enemy bomb. But there has been contrary testimony by nuclear scientists, they added.
>
> Stans said he had talked this over with scientific advisers to the President and recalled 'that it can not be presumed that any atomic weapon shot down is necessarily going to explode.'
>
> 'There is a triggering action that is necessary to set off a bomb, and if that triggering action has not taken place, then the bomb is not necessarily going to explode on impact,' Stans added.
>
> Stennis, who has heard much secret testimony as a member of the Armed Services and Appropriations Committees, agreed and added that scientists said some nuclear bombs could be fitted with 'a dead-man's fuse' that would explode them after they fell.
>
> Stennis and other Senators also questioned what would happen to cities and other populated areas in this country when U. S. nuclear warheads are exploded overhead or nearby, or did trigger off an enemy bomb."

Apparently it never occurred to these "experts" that it makes some difference whether a bomb explodes over a target or over uninhabited land.

These abuses of civilian power often are perpetrated in good conscience because civilians are convinced that the military are militarists, that they cannot think straight, and that they are only interested in the vested interests of their services. These abuses are abetted by the military who have been overimpressed by the need to resist any "militaristic" urges and who have been brainwashed to a point where they consider that "civilian authority" alone is justified to formulate the law of the land. This brainwashing of the military begins in the military schools where, at this writing, the soldiers are taught practically everything of importance to civilians,

perhaps with the exception of art appreciation and home economics, but hear very little about professional military problems. The war colleges have overcome the dangers of "dogmatism" but they do not succeed in imparting constructive strategic thinking; and they won't so long as the lecturing is done by "professors" instead of conflict thinkers. A director of a military school once asserted that the officers were learning tactics when they were with their units, hence they needed no theory about it. In another instance, when a college commander was asked why the student officers were given inadequate schooling in logic and creative reasoning, he argued it must be presumed that officers in the rank of colonel are perfectly capable of thinking, and that consequently, instruction in advanced logic and computer problems would be a waste of time.

Whatever damage militarism, the caste spirit of the officers corps, and the soldiers' will to political power, may have done to Western nations in the past, the United States, and to an even more pronounced extent Britain, now are suffering from ideological antimilitarism or civilism. In these countries the military are distrusted for no better reason than prejudice and ignorance, and sometimes doctrinaire pacifism. Hence strategic and politico-military decisions are made without proper regard to military facts. Traditionally, the armed forces are being denied the implements of security they need to fight the wars which the politicians cannot prevent. In fact, public and academic opinion in the Anglo-Saxon countries has become convinced that the knocking of the military is the pinnacle of political wisdom and the high road to freedom and peace. Not even the lessons of the American Revolution have been learned. This country would not exist if the political fools, whose "wise" decisions constantly played into the hands of the British, had not been checkmated by the self-abnegation of *General* Washington. The budget-cutters certainly did not serve as midwives when this nation was born.

It is very true that militarism was one of the causes of both world wars. It is no less true that World War I was brought upon by civilian plotting in Austria-Hungary and Russia, and to a lesser extent in Germany; that behind the militaristic groups in Germany which prevented a compromise peace were strong industrial pressure groups; that the militarism which brought on World War II was of a strictly civilian variety, with most of the generals opposed to war; and that conversely, the lack of military strength in France and Britain, which produced the main condition in which Hitler could function as an aggressor, was due to civilian policies inspired by disarmament and budget illusions as well as the desire "to put the military into their place." The German military were almost ready to overthrow Hitler in 1938; they organized an attempt on his life in 1944; the Japanese navy neutralized the warmongers of the Japanese army at the end of World War II; Marshal Badoglio overthrew Mussolini; Marshal Pétain preserved the integrity of the French nation after it almost was destroyed by the follies of civilian leadership; and General de Gaulle restored a functioning state after the civilians were unable to do so for fourteen long years.

While undoubtedly the dangers of "militarism" must be curbed, (and this means at present) above all, the dangers of false military thinking, the problems posed by civilism are far worse, partly because they still remain unrecognized. It has been said that militarism thrives only when civilian leadership is defective. For example: one idea underlying the recent reorganization of the Defense Department is that the Secretary of Defense should make decisions in case the Joint Chiefs are unable to agree. Indeed, one Solomonic major decision bearing on air defense missiles was made by the Secretary when he retained both claimant weapon systems, but slashed them both. Thus, he kept the two competing services "happy" and also "saved" money. Undoubtedly, decisions of this type are far removed from creative leadership, yet

theoretically, no one would quarrel with the concept of a superior civilian authority. The very possibility that some one *may* make a decision could bring about agreement at the lower level of the service chiefs. It also may be argued that a bad decision usually is better than none.

It behooves us, however, to consider some of the practical facts of life. The civilian Secretary of Defense usually has very little military experience; he even may have no experience in military administration. He is thrown into an extraordinarily complex job which, despite assertions to the contrary, he cannot learn within two or even three years, and he may not stay more than a few months after his apprenticeship has been completed. While he is on the job, his time is taken up with so many political duties that his "decision-making" on military matters must tend to be of a superficial and clumsy type. In many instances, of course, the talk about civilian decision-makers is plainly ridiculous, since civilian secretaries often have become the "prisoners" of leading soldiers. Actually, most secretaries have recognized their military incompetence and have stuck to politics and administration, *but* they inevitably were drawn into the battle of the budget. Hence it would be a mistake to underrate the enormous impact of civilian secretaries—about two dozen of them—on strategy, military technology, tactics, and morale. Civilian presidents and Congressional committees, sometimes even individual Congressmen, also exert strong influence. The area of unique military responsibility has become very restricted and is contracting more and more. The meddling of one service in the affairs of another also undermines the freedom of action of military leaders. And to top it all, there are innumerable "regulations" and legal provisions as well as "management" practices which practically eliminate the main prerogative of military leadership —authority to give orders, and exact obedience.

Let us look at a few cases. How can strategy and tactics be decided upon by the budget-maker? Recently, for example, there has been a great deal of criticism against the "SAC philosophy" of using large nuclear weapons. Leaving aside the military justification of this concept, the fact remains that with a given limited budget, no other effective strategy can be bought. This aspect is usually left out from the discussion. It is a fair guess that most of the civilian critics who oppose "total war," also would oppose the added large expenditures which might allow the United States to fight a "limited unlimited war."

There is furthermore the imposition by civilians of technological concepts upon the military. This may take two types of interference: the advocacy of weapon or support systems which are attractive in theory but not so effective in practice, or a veto against new programs which are necessary to maintain qualitative superiority but which are "stretched out," postponed, or eliminated on the grounds that the concept is not yet proven or that, in the absence of funds, it must be accorded lesser priority. Very often this practice degenerates into a vicious circle. In order to get a program accepted, its feasibility must be proven beyond the shadow of a doubt; but in order to prove feasibility, R & D programs are necessary which are not being funded because the concept has not yet been "proven."

Frequently, this type of maneuver has strictly fiscal significance: the country allegedly cannot "afford" its military needs. (Incidentally, it would pay the military to train a few economists who could represent the principles of *security economics* with greater conviction and demolish the delusions of the business-as-usual advocates.) It still remains that scientific bodies, usually constituted as committees, often make "technological" findings which are militarily wrong, and sometimes advise on matters which are clearly outside their province; such as, when they talk about the "morality" or the political acceptability of weapon systems rather than about their technical features.

The committee racket can be played effectively with a modicum of skill: all the "decision-maker" has to know is the biases of various scientists, and to compose a committee in such a way that the desired finding will be reached without equivocation. Should there be an unforeseen accident, the political "decision-maker" still can claim that he is not satisfied with the evidence presented and that a second committee must research the problem again. Cases have been known of eight or nine subsequent committees investigating one single problem within a three-year span. The celebrated mentality of Colonel Blimp, and in particular the good Colonel's inability to comprehend modern technology and the hazards of the lead-time race, are no longer an exclusive characteristic of military leadership. *Mr.* Blimp can be found in all civilian echelons—and there are many—where military decisions are being made.

Civilian meddling predominates in the field of disarmament where, without let-up, one impractical scheme follows the other. Since the end of World War I, the disarmament craze has been a mental affliction, particularly among Anglo-Saxon politicians. Although disarmament policies functioned as a strongly contributory cause of World War II and the Korean war, the game continues to be played regardless of the enormous cost in security. The disarmament illusion often is paired with an illusion about the benign and "basically peaceful" nature of the enemy; this twin illusion has been at the bottom of many cuts in military budgets and oppositions to specific programs. It is remarkable that responsible soldiers, the alleged militarists of today, often fall themselves for some of the phoney pro-disarmament arguments. In most instances the military are extremely careful not to expose disarmament fallacies; on the contrary, they pay lip service to this ideology and do not even rise in protest when disarmament policies are based upon wrong or slanted information. For fear of being accused of spreading militarist propaganda, the services have abstained from conducting information programs explaining the true problems of security to the nation.

What it all boils down to is, that the civilians play politics with national security and consequently with the military establishment, usually for no better reason than electioneering, yielding to pressure groups, intellectual incompetence, and wishful thinking. Attitudes of this type permeate many areas of public life, but the trouble is that in the military sphere, such practices must lead to war and disaster. In the book which Dr. Vagts wrote in the spirit of a former epoch, he recommended that soldiers should recognize that "democracies . . . are after all the best purveyors of soldiers and the best employers of officers." This recommendation has been accepted by the American services long ago, and probably far too uncritical and naively.

The more significant question is this: when will the civilians wake up and recognize that professionally competent armed forces are an indispensable element of statecraft; that competent military judgements must be listened to; and that, if security and the maintenance of peace are the highest goals of political leadership—as is professed in every speech—the military cannot be used as the sacrificial goats for the customary games of politics and economic advantage? Dr. Vagts was eternally right when he wrote:

> "Lack of a general fund of widely disseminated military information is perilous to the maintenance of civilian power in government. The civilian mind, presumably concerned with the maintenance of peace and the shaping of policies by the limits of efficient military defense, can derive no instructions from acrimonious disputes between militarists, limitless in their demands, and pacifists, lost in utopian visions. Where the civilians fail to comprehend and guide military policies, the true military men, as distinguished from the militarists, are also imperiled . . . Again and again, military men have seen themselves hurled into war by the ambitions, passions, and

blunders of civilian government, almost wholly uninformed as to the limits of their military potentials and almost recklessly indifferent to the military requirements of the wars they let loose . . . They may again be thrown by civilians into an unforseen conflict . . . It is this prospect which has led military men, engaged in relating armies, to the context of society and its potentials of warfare, to demand the formulation of civilian policy."

Democracies suffer from civilian irresponsibility; the cost of this irresponsibility in treasure, as well as in blood, has been enormous. In the nuclear age, this cost may rise to a point where free society will be destroyed. Yet the soldiers are expected to rescue the politicians, in the name of democratic ideals; and indeed the military, time and again, have saved democracy. When we will have blundered into World War III, the politicians will insist that the same old game be continued, lest we lose our freedom. But the uniqueness of the current global challenge finds no counterpart in past military or political experience; it cannot be resolved by archaic patterns of the past. If we really want to preserve our liberties, we must give sounder recognition to the singular features of our current peril, and provide the means that an effective response demands. Let us begin by being honest to ourselves.

THE DEFEAT OF THE GERMAN AIR FORCE

The seeming paradox of the attack on the aircraft plants is that, although production recovered quickly, the German air force after the attacks was not again a serious threat to Allied air superiority. The attacks in the winter of 1944 were escorted by P-51's and P-47's and with the appearance of these planes in force a sharp change had been ordered in escort tactics. Previously the escort planes had to protect the bamber force as their primary responsibility. They were now instructed to invite opposition from German fighter forces and to engage them at every opportunity. As a result, German fighter losses mounted sharply. The claimed losses in January were 1,115 German fighters, in February 1,118, and in March 1,217. The losses in planes were accompanied by losses in experienced pilots and disorganization and loss of the combat strength of squadrons and groups. By the spring of 1944 opposition of the Luftwaffe had ceased to be effective.

German air generals responsible for operations in France stated under interrogation that on D-Day the Luftwaffe had only 80 operational planes with which to oppose the invasion. At no time between D-Day and the breakthrough at St. Lo did reinforcements offset losses and increase the size of this force. (U. S. Strategic Bombing Survey)

LETTERS TO EDITOR . . .

Dear General:

Enclosed you will find my check for this years contribution. I have enjoyed the magazine, *The Airpower Historian*, and intend to continue my membership in your fine organization for a good many years to come.

This month I will be leaving the ZI for an overseas assignment. Please send all future correspondence to the address shown below.

I have suffered a terrible and tragic loss of saved, cherished, and treasured old back copies of *The Airpower Historian* and would like to know if there is any avenue open to me which will allow me to order from you all back copies to date. I am willing to pay any price asked, and desire these copies for the historical accuracy and richness of detail so seldom found in modern periodicals.

Sincerely,
EDWARD N. GARCIA
1st Lt., USAF

Dear General:

How good it is to see the wartime history of USAAF Combat Units being given long, overdue publicity. Mr. Rust has obviously gone to great lengths to ensure an accurate and factual account which makes absorbing reading. May we have more articles of this nature.

The duplication of aircraft squadron identification lettering in the 78th and 31st Fighter Groups, referred to by Mr. Rust, was a deliberate move to confuse the enemy as to the movement and establishment of forces in different theatres of war. This policy also extended to other AAF squadrons that moved down from England to Africa late in 1942. When, in 1944, fighter squadrons with duplicated markings began flying the same aircraft type from England and Italy to the battle skies of Germany, understandable confusion arose over identification. This was remedied by the addition of distinguishing colour markings.

A further, less explainable, duplication of 78th and 31st Fighter Group markings occurred in the immediate post-war years. The 31st forsook its red striped tail insignia of World War II, and painted its F-84s with the black and white checkerboard nose marking that had been the 78th's pride.

Yours faithfully,
ROGER A. FREEMAN
National Association of
Aviation Enthusiasts
Essex, England

Dear General Anderson:

As an ardent reader of your wonderful publication, *The Airpower Historian*, I want to thank you for your efforts and for the privilege of receiving this publication during the year.

Unfortunately your last issue was rain damaged when delivered to my address. Since I am saving all issues I would appreciate it if you could send me another copy of that particular issue. If there is any charge for a duplicate copy please advise me and I will remit the necessary amount.

Thank you for your cooperation and again congratulations on a fine publication.

Yours truly,
COLIN H. KIDD
Hackensack, New Jersey

Dear General Anderson:

I have enclosed a check to cover the dues for a four-year membership in the Foundation. I would like to thank you and voice my appreciation for providing me with such a fine magazine. Since my Air Force service is of recent origin what I learn of its traditions and past accomplishments must necessarily come from reading such publications as *The Airpower Historian*. I feel that this magazine plays a large part in my training and education as an Air Force officer.

Sincerely,
WILLIAM F. BRENNAN
1/Lt., USAF

BOOK REVIEWS

THE LIFE AND DEATH OF THE LUFTWAFFE, by Werner Baumbach, translated by Frederick Holt: Coward-McCann, Inc., 1960, $3.95.

Here is another worthy volume to whet the reading appetite of the growing ranks of those interested in the full history of the German Air Force in World War II. Tasty and meaty, Werner Baumbach's historical analysis is not a complete or fully satisfying meal. But this volume is certainly on any recommended reading menu.

It is not a new book. It was largely written immediately after the end of the war when Baumbach and other high-ranking *Luftwaffe* officers including Adolf Galland were enlisted by the U. S. Air Forces in Europe to compile the historical lessons of the air war as viewed through defeated German eyes. Headed by the Chief Historian of the German Air Force, General von Rohden, this small group prepared fourteen monographs with the aid of fresh and bitter memories as well as selected German documents provided them. The so-called "von Rohden Project" manuscripts, only five of which were ever translated into English, have never been widely noted or exploited.

Galland's fighter pilot contributions were incorporated into his well-known book, *The First and the Last*. Baumbach's writings are available now in English for the first time. There seems to be some questions as to how much Baumbach actually contributed to the von Rohden manuscripts. But the present volume in hand previously appeared in two separate books, one of which first appeared in Argentina while both were published in Germany circa 1949.

Baumbach emerged out of the combat operations during the early and victorious campaigns of the *Luftwaffe* in World War II. He first learned to fly in gliders, the Nazis also providing ample political indoctrination. He became a Stuka dive-bomber pilot. And, he was highly decorated for his antishipping exploits (one-third of the total *Luftwaffe* effort well into the Battle of Britain). As a junior, rapidly-promoted officer, he quickly became a fair-haired favorite of top *Luftwaffe* officers such as Ernst Udet and Chief of Staff Jeschonnek. Their respective suicides as the fortunes of the *Luftwaffe* began to decline (because of the stiffening air contest in the West and the enormous draining of strength on the Russian front) left Baumbach circulating in high echelons behind the scenes in the *Luftwaffe* high command. He became an advocate for the exploitation of technical advances in aircraft procurement and employment. Among other things he supported Galland's unsuccessful debate with Hitler on the Me-262 jet fighter as an interceptor rather than as a counter-invasion "blitzbomber." Little evidence indicates that Baumbach was particularly effective in his personalized efforts to persuade his leaders, although this is always difficult to document.

Werner Baumbach thus never held a major command. But as an ambitious and observant young man in his late twenties, he had a choice box-seat in the *Luftwaffe* high command as the final curtain of defeat in the air was lowered. He was killed in 1952 in Argentina, where he resided in self-imposed exile with Galland, Kurt Tank (designer of the FW-190) and other Germans with political complications.

No compilation of apologia like some of the former Army General Staff officers who held many high *Luftwaffe* posts, Baumbach's treatment does not strongly blame Hitler or Goering by name or even the Nazi system in principle for many of the strategic errors which greatly aided the Anglo-American air effort in the European theatre. Some of the deficiencies of the *Luftwaffe* leadership and organization he related without fully comprehending their consequences. Yet he reveals in his writing an airman's view of some of the fundamental turning points of the air war.

Baumbach was neither a cautious historian nor a skillful literary craftsman. Some specialists may be quick to dismiss his subjective and imperfect treatment of what today yet remains as an incompletely documented war. This volume does, however, seem to provide useful insight into the not-easily-recreated German viewpoint. Serious students of air power in this TNT war will benefit from his grasp of what seems a reasonably valid picture, particularly if one wants to carefully examine both sides of that war.

In contrast to Galland in his book, Baumbach did not fully exploit dramatic personal anecdotes at crucial moments of decisions. Those who met Baumbach have told me that he was an extremely personable but also a very passionate man. His word picture of Udet's funeral with the symbolic oration by Goering himself, is particularly noteworthy. American readers will appreciate his intimate revelations on what happened to the long-range four-engine bombers and the 1942 concept for aerial refueling.

And to this reviewer there seemed to be some timeless historical lessons of current value in this book if the reader will translate time and technology and national mores to similar contemporary problems of weapons systems research, development, and force structure. Human nature, the inevitability of technical change, and the fundamental strategic principles have some basic inalterable features. But the reader will have to update and translate these conceptual fringe benefits for himself.

Dr. Eugene M. Emme,
Historian, NASA.
Washington, D. C.

STRIKE FROM THE SKY, The Story of The Battle of Britain, by Alexander McKee: Little, Brown & Co., Boston, 1960, $4.75.

In a fascinating account of The Battle of Britain, Alexander McKee combines in a telling manner the overall strategic value of the campaign with the intensely personal stories of the men who fought it.

Mr. McKee writes with the precise hand of a man who knows and loves his subject. In 1940 he realized that no detailed records were being kept of a battle which ranked with Trafalgar. McKee kept a detailed diary, visiting targets immediately after an attack, and interviewing eyewitnesses.

Much of the fresh quality of the book stems from his numerous interviews with participants in the battle. In the Acknowledgments section he recognizes the assistance of the British and German Air Ministries, credits two books, and gives individual thanks to over eighty persons whom he interviewed, and whose recollections give life and motion to the book.

Mr. McKee sees The Battle of Britain as a unique campaign—the first and last in which a few hundred fighter aircraft spelled the difference between life or death for a nation.

In his narrative he makes it clear just how close the Germans came to victory, and just how well the Luftwaffe was employed. In recent years, many accounts of The Battle of Britain have given the impression that the Royal Air Force won a total, smashing victory over an ineptly used German air arm. This was far from the actual case, as the Germans came increasingly closer to victory as the campaign progressed.

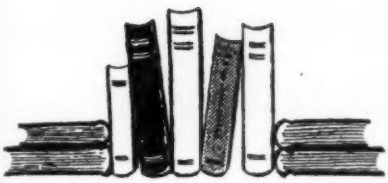
That the Germans did not win, was the result of a number of factors, the most important being the time limitation by the Nazi High Command. Air supremacy *had* to be established between the 11th and 17th of September, or no invasion could take place in 1940. It was not so established.

The Germans recognized that the key to the battle was the destruction of the Fighter Command. Once air supremacy was established the Luftwaffe could support the German navy, enfeebled by the Norwegian campaign, in sealing off the channel. The Royal Air Force also recognized the key importance of Fighter Command, and managed to conserve its strength long enough to survive the crucial battles of September.

Mr. McKee's major contribution with this book is to place in relative order the factors, which have all been labeled by one authority or another, as being "decisive." He examines each one—the advantage of English radar, the switching of target complexes by the Germans, the limited 105-minute flying time of the Messerschmitt 109, the fine qualities of the Spitfire and of the RAF pilots, the valor and resilience of the English people—and he places each in perspective.

The human side of the story, the effect of aerial combat on attacker and defender, is presented with a pictorial quality comparable to the writing of Pierre Closterman. The incredible swiftness of combat, the suddenness of death, and the violence of tension-relieving laughter, are vividly depicted. Equally gripping is the technical side of the story which sees two adolescent air arms mature in battle.

Walter J. Boyne
Captain, USAF



RECENT BOOKS

ARMY, Chief of Military History, *Command Decisions*. London: Methuen, 1960, 42s. Decisions the author declares to have 'decided the outcome of World War II.' Shows the extent to which today's world was determined by the course of events in World War II.

BAGOT, SIR JOHN, *War in the Desert*. New York: British Book Center, 1960, $6.25. The RAF campaign in the desert during World War II.

BROWN, CAPT. WALLACE L., *The Endless Hours*. New York: Norton, 1961, $3.95. An account of the author's two-and-one-half year imprisonment in a Red Chinese prison after a mission in the Korean War. Not a pretty book to read, but it is the record of a man who acquitted himself bravely.

CAIDIN, MARTIN, *Black Thursday*. New York: Dutton, 1960, $4.95. Mission 115 against the ball-bearing plants at Schweinfurt, Germany when 600 American airmen were lost on October 14, 1943. A superb account of the B-17's 'longest day' in World War II.

DEUTSCHER, ISAAC, *The Great Contest: Russia and the West*. New York: Oxford University Press, 1960, $2.75. In a brief examination of post-Stalin Russia, a leading authority analyzes trends and currents which characterize Khrushchev's regime.

FEIS, HERBERT, *Between War and Peace*. Princeton: Princeton University Press, 1960, $6.50. The best summary yet to appear of the decisions relating to European problems at the Terminal Conference in July 1945. Shows why Allies in a moment of victory feared for the future.

GANN, ERNIE, *Fate of the Hunter*. New York: Simon and Schuster, 1961, $6.00. A look at transport flying from the years of the DC-2 to the mid-1950s.

HAHN, WALTER F., *American Strategy for the Nuclear Age*. New York: Doubleday, 1960, (Anchor Books), $1.45. Appropriate and urgent measures must be taken to overcome the forty-year lag in our thinking on the nature of war. Lectures by prominent authorities given at National War College, 1959.

ISMAY, HASTINGS LIONEL, *Memoirs*. New York: Viking, 1960, $6.75. An important book about the planning and conduct of World War II. An inside view of war leadership at its highest levels in a well-organized account with scarcely a dull page.

JACOBSON, HAROLD KARAN, *America's Foreign Policy*. New York: Random House, 1960, $6.50. A well-organized anthology of the best writings of outstanding specialists.

KENNAN, GEORGE F., *Russia and The West Under Lenin and Stalin*. Boston: Atlantic-Little, Brown, 1961, $5.75. An engrossing book showing U. S.-Russian relations 1917-1945 and the fundamental difficulties in framing a rational western policy toward the Soviet Union.

KIRBY, MAJ. GEN. S. WOODBURN, *The War Against Japan, Vol. I, The Loss of Singapore*. London: H.M.S.O. 1957, $10.22. A story of incompetence, inter-service jealousy and lack of overall supervision.

POOLMAN, KENNETH, *Zeppelins Against London*. New York: John Day, 1961, $4.50. These were the first attempts at strategic bombardment and the first attempts to undermine directly the civilian will to resist. The first Zeppelin strike took place on May 31, 1915.

SNELLGROVE, L., *From Kitty Hawk to Outer Space*. New York: Longmans, 1961, 8/6 net. Includes a time chart of main events, 1903-1959.

WARBURG, JAMES P., *Disarmament: The Challenge of The Nineteen-Sixties*. New York: Doubleday, 1961, $4.50. The author feels complete and universal disarmament is one of the great imperatives of our time.

RECENT ARTICLES

Arms Control (Special Report), *Business Week*, March 18, 1961, pp 54-56. Includes: organizing for arms control; how to check on arms control; and, can the U. S. and Russia negotiate arms control?

"The Balance of Military Power," *Business Week*, March 18, 1961, p 68. U. S. and U.S.S.R. bombers, missiles, and conventional forces.

BLUMENSON, M., "Politics and the Military in the Liberation of Paris," *Yale Review*, Vol. 50, December 1960, pp 271-286. Political and military considerations are inseparable in the conduct of war. In theory, they seem separate, but in practice they are not.

CANNON, JAMES M., "CIA: How Super the Sleuths?" *Newsweek*, Vol. 57, May 8, 1961, pp 29-30. *Newsweek* puts together a picture of the agency whose role in Laos and Cuba has blown up a storm of controversy.

CRANKSHAW, EDWARD, "Khrushchev and China," *Atlantic*, Vol. 207, May 1961, pp 43-47.

"Defense: Action in the E Ring," *Time*, Vol. 77, April 7, 1961, pp 20-24. Diplomatic-military success depends on whether the President follows through on the doctrine to which he has subscribed: to win the cold war.

"History-making First in Aeronautics," *New York Times Magazine*, pp 102-103, May 7, 1961. Reactions of explorers who achieved daring 'first' in their time.

HUNTINGTON, SAMUEL P., "Interservice Competition and the Political Roles of the Armed Services," *American Political Science Review*, Vol. 55, March 1961, pp 40-52. In the middle 1950s, the interservice debate became less what should be done than how it should be done and by whom.

LYONS, GENE M., "The New Civil-Military Relations," *American Political Science Review*, Vol. 55, March 1961, pp 53-63. The nature of civil-military relations is being changed through the strengthening of central organization in the DOD, through professionalization of civilian leadership and through the broadening character of the military profession.

McNAMARA, ROBERT S., "National Defense Policies," *Vital Speeches*, Vol. 27, May 15, 1961, pp 452-454. "The President's defense program is designed to improve the capacity of the military establishment to adjust to changing military needs. Decisions will not be influenced by pressure groups."

MARTIN, D. F., "Will Aircraft or Missiles Win Wars?" *Flying*, Vol. 68, February 1961, pp 32-33.

O'BALLANCE, MAJOR EDGAR, "A New Look at Soviet Military Forces," *Military Review*, Vol. 41, April 1961, pp 71-81.

ROVERE, R. H., "Attempted Invasion of Cuba," *New Yorker*, Vol. 37, May 6, 1961, pp 139-146. "For better or worse, the ill-fated expedition to the Bay of Pigs may breed in revolutionary leaders in Latin America an awareness that the way chosen by Castro is a perilous one, while a clean revolution may win support from a nation that is still the most powerful of all."

SNOW, C. P., "Whether We Live or Die," *Life*, Vol. 50, February 3, 1961, pp 90-92. An overwhelming fact of our time is that the cardinal choices which lie before nations must be made by a handful of men working in secret. Two choices of World War II were up to Sir Henry Tizard, who had to decide whether to go ahead with radar; the other choice whether to undertake massive strategic bombing demanded by F. A. Lindeman.

SPAATZ, CARL A., "Case for the B-70 in An Age of Missiles," *Newsweek*, Vol. 57, April 17, 1961, p 34. "The best missile will be next to useless without the up-to-the-minute reconnaissance only a manned plane can still supply today.

"USAF's New Commands," *Air Force*, Vol. 44, April 1961, pp 39-43. Explanation and charts on the new Air Force Systems Command and the Air Force Logistics Command.

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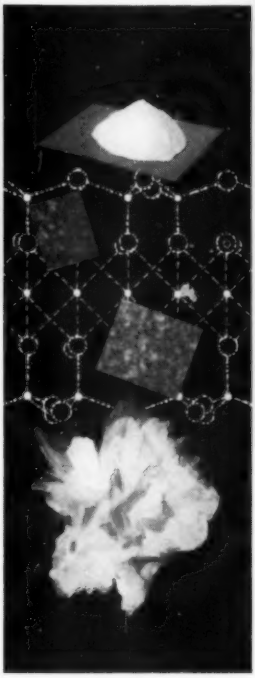

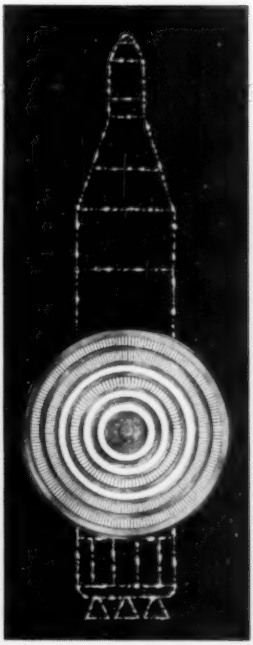

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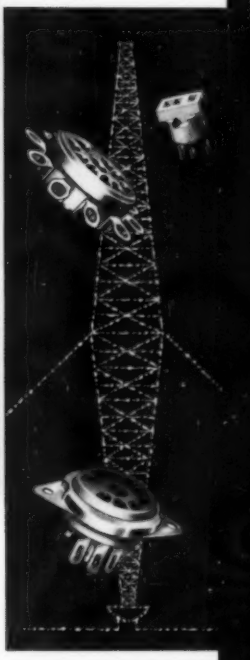

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